THE BUILDER

INCORPORATING

"ARCHITECTURE" AND "THE BRITISH ARCHITECT"

VOL. CLXIV JANUARY 22 1943 NO. 5216

AID FOR THE PLANNER

WE must welcome the activities that are now being displayed by various bodies in the preparation of data essential as a sound basis for the various constructive proposals on which the future organisation of our national development depends. These studies will not only be of great value to the new Ministry of Planning, but in diffusing more widely a popular comprehension of the problems involved will make the task of the Government easier by creating an appreciation of the necessity for action among the general public.

The programme of the Association for Planning and Regional Reconstruction covers a wide range, and is taking shape in Broadsheets issued from time to time on various aspects. Nos. 1 to 10 of these are before us, starting with such general questions as the influences dictating regional delimitation, the scope of the investigations required, the types of housing, the organisation of supplies, disposal of waste and sewage treatment. These Broadsheets are, in several cases, aimed at evoking thought on the subject they deal with, and only claim to be an introduction to further more extended investigations; some are more conclusive, but in both cases they are logically worked out and well provided with appropriate graphs and statistical diagrams.

The Association is also responsible for the preparation of a series of 24 maps of Great Britain bearing such arresting titles as "Rural Solitudes and Urban Sprawl" (4), "Trees and Trusts" (5), "Save the Best Farmland" (6), "Foundations of Industry" (8), "Raw Material of Cities" (12), etc. Copies of 14 of these, to a reduced scale, have been issued by "The 1940 Council" with a description by Prof. E. G. R. Taylor, D.Sc. A good feature in this is the transparent population map which can be laid over any of the others for comparative studies.

The value of these studies in supplementing those of the various professional bodies and of the School of Economics, lies in the fact that while they may include technical questions such as sanitation, housing or agriculture, they are not limited to these, but can range over the whole field of human thought, with its psychological, social, and physical requirements, factors which are basic in fashioning the material setting of a good standard of life for all types and classes of our people, including their work, homes and recreations. It is true that the professional services must visualise all these, but it is also of importance that bodies on which all classes are represented should take the opportunity of formulating their views, helpfully supplementing the studies of the technicians.

All constructive work involves co-operation between the promoter and his professional adviser: the first has to define his demands, and the second to provide for their fulfilment; every architect or engineer knows how much more satisfactory the result is likely to be if these demands are intelligently and logically set down at the outset and what a pleasure it is to work for clients capable of doing this. Therefore, the more widely their capacity for this comprehension of the essentials of any problem—be it one of production, distribution, hygiene, education, recreation or home life—is diffused, the more successful will this collaboration prove, to the general benefit of all concerned. We may, therefore, look on the efforts of the non-technical or, as we may more accurately describe them, the multi-technical groups, all active people being technicians in one direction or another, in the light of educators, giving a wide training in the knowledge of the relationship of their members' activities to the general economy, and in the power of expressing this knowledge and the resulting demands systematically, logically and clearly.

The work of the Association for Planning and Regional Reconstruction, together with that of a number of other groups having somewhat similar aims, may thus be commended as having a double value; not only is a mass of important information being collected and distributed, but a large number of those taking part are by so doing educating themselves to a point that renders them more fully qualified to give valuable service to the community in the future. The Broadsheets before us clearly indicate the extent to which the conferences and discussions which resulted in their production must have clarified the minds of those contributing the ideas. They embody and unify the opinions which may at the start have been more vague or even in conflict. Public opinion on complex problems needs this procedure, focusing it on to specific points to become convincing and effective, and the wider the extent of the ground which groups such as this can cover, and the greater the publicity their efforts can secure, the better hope we may have for the future of the community as a whole.

There are indications that there are still vast masses of people incapable of visualising any very definite changes in social organisation on the one hand, and on the other, a smaller but very active proportion who are prepared to rush into any adventure in it, without due justification as to its economic validity or social repercussions. It is therefore of importance that as many as possible of those competent to do so should qualify themselves to influence their circle towards conclusions which, while giving due weight to traditions of value, will not stifle developments that can be proved to be advantageous, and will stimulate Government action, which might otherwise lag behind the needs of the time owing to its fear of framing unpopular measures.

NOTES AND NEWS

The Price of Planning.

SPEAKING at St. Paul's Cathedral last week, the Archbishop of Canterbury said we heard a great deal in these days about planning, and most of us thought there was room and need for very much more planning in our national life than we had previously had. But we must recognise that planning was possible only at the cost of some loss of liberty. We must not deceive ourselves for one moment in supposing that we could have the advantages of planning and also retain the enjoyment of unfettered freedom. The whole essence of planning was that it was a restraint on a great many liberties.

Members of Fine Art Commission.

THE KING has approved the appointment of *Lord Crawford and Balcarres* to be Chairman of the Royal Fine Art Commission, and of the following to be Members: L. Patrick Abercrombie, Ralph Freeman, Charles Holden, *William G. Holford*, Lord Lee of Fareham, Sir Edwin Lutyens, R. C. Norman, A. E. Richardson, *J. Hubert Worthington*, and *Geoffrey F. Webb*. The names in italics are of the new appointments.

PRINCIPAL CONTENTS

ARTICLES	Page
LEADER: Aid for the Planner	81
STRUCTURAL PLASTICS. By T. Warnett Kennedy	89
THE NATIONAL FEDERATION: Annual Report	94
BUILDING AND CIVIL ENGINEERING CALL-UP ...	96
FUTURE BUILDING ... 97,	100-2
WAGES, PRICES CURRENT	98-100

ILLUSTRATIONS

UNIT-BUILT HOUSES IN AYRSHIRE. By Sam Bunton, L.R.I.B.A.	85

New Year Honours.

To the list of those connected with the building industry who appear in the New Year Honours List must be added: *O.B.E.*, Lt.-Col. F. R. Boyd Haward, F.R.I.B.A., of Great Yarmouth; Mr. Neville Wynne-Jones, F.R.I.B.A., Chief Architect, Public Works Department, Ceylon. *M.B.E.*, Mr. Alexander M'Culloch, City Engineer's Department, Glasgow.

Architectural Lectures on Planning.

A COURSE of six lectures for architects on town and country planning will be held at the R.I.B.A. on alternate Wednesday evenings during February, March and April, commencing on February 17. The lectures are intended primarily for the benefit of those architects interested in town and country planning, and they will deal with the general principles of planning and planning administration. Admission will be free to all registered architects, but application must be made beforehand to the Secretary, R.I.B.A., for cards of admission. The first three lectures (which begin at 6 p.m.) will be as follows:—

Wednesday, February 17—"The Village and the Small Town," by Mr. A. W. Kenyon, F.R.I.B.A., M.T.P.I.

Wednesday, March 3—"Town and City," by Professor W. G. Holford, M.A., B.Arch., A.R.I.B.A., M.T.P.I.

Wednesday, March 17—"Communications," by Sir Charles Bressey, C.B., C.B.E., D.Sc., D.L.

Architect Admitted to City Freedom.

MR. ROBERT CROMIE, F.R.I.B.A., has recently been admitted to the Freedom of the City of London. Mr. Cromie, who is acting as War Damage Surveyor to the Duke of Westminster, has also become a liveryman of the Worshipful Company of Woolmen.

An Architectural Appointment.

THE Governors of Queen Anne's Bounty have appointed Mr. A. P. Lay as architect to succeed Mr. Martin Skinner, who has retired.

L.N.E.R. Appointment.

THE L.N.E.R. announce that Mr. R. M. Scott, F.S.I., of Glasgow, has been appointed Factor of the company's Scottish Area with headquarters at Edinburgh, in succession to the late Mr. J. Johnstone.

The late W. E. Gill.

WE regret to record the death of Mr. William Ernest Gill, of Southport, at the age of 68. From 1912 he was in the Government Land Valuation Office, retiring in 1939.

City Property Owners: New Association.

FOLLOWING the general meeting of the Associated Owners of City Properties to be held on January 29 at the Abercorn Rooms, Great Eastern Hotel, Bishopsgate, E.C.2, at 12 noon, Sir Charles Bressey, C.B., C.B.E., Vice-Chairman of the Royal Academy Planning Committee, will give a short talk on "London of the Future."

Model of a New Town.

A LARGE-SCALE model of a new town, designed by Mr. Thomas Sharp, M.A., M.T.P.I., is now on view (until Saturday) at the Building Centre, 23, Maddox Street, W.1.

Replanning of Bristol.

EVERY phase of the life of Bristol is represented among the 140 associations which comprise the Planning Advisory Committee organised by Bristol Chamber of Commerce and Shipping. These societies are divided into appropriate groups, and an interim report has been prepared, and is in the hands of the Corporation.

In the preservation of our soil
Ed. Brian. Bretherton. Smithdec
For at Dunkirk & the Battles of Britain.
August 1940
Never in the field of Human Conflict
was so much owed by so many to so few

COMMEMORATIVE STAINED GLASS MEDALLION,
Executed in enamel for Tattenhall Church, Chester.
BY REGINALD HAELWARD.

CORRESPONDENCE

[Whilst we are glad to publish letters on professional and other matters of interest to our readers, it must be understood that we do not necessarily endorse the remarks of correspondents, who will oblige us if they will express their views as briefly as possible.]

The Future of the Quantity Surveyors' Profession.

To the Editor of *The Builder*.

Sir,—In replying to the points raised by "Craftsman" to my former letter on this subject I would like to emphasise that my principal object was to point to the desirability of wider and more practical training for quantity surveyors if they are successfully to undertake the duties which will be required of them after the war.

I quite agree with your correspondent that under the cost-plus form of contract the quantity surveyor's powers will have to be extended so that he becomes, if not a building administrator, at least the authority determining the admissibility of costs for labour and materials together with charges for plant and overhead expenses as laid down by the conditions of contract. Notwithstanding the strictures that have been levelled against this Form of contract, or rather the abuses which may arise through inefficient administration under this Form, yet with proper safeguards and adequate control of them within the functions of the surveyor, the cost-plus contract must still be of use for particular classes of work, especially those of a jobbing character or where the ultimate outlay is impossible of pre-estimation.

Again, the schedule contract, where works are measured as executed and priced at unit rates negotiated before the work is undertaken, also calls for the residence on the site of the surveyor and his contact with the works at every point. In the case of undertakings of any magnitude such a contract can only be carried out successfully where the surveyor is in touch with the work throughout its whole progress. Practical knowledge of building processes and their relation to value must continually be in the surveyor's mind if he is to carry out his duties under this form of contract.

I am in complete agreement with your correspondent as to the unsuitability of the War Department Schedule as the basis for settling values for building works generally. Its scope is so wide as to make much of it irrelevant for valuing new building works. Moreover, it is so complex in structure that it is possible to arrive at different results for the same class of operation by using different parts of the Schedule. Another misuse of this Schedule is due to the direction in some contracts that rates found in the Schedule may be used to supplement bills of quantities and provide bases of valuation for work not covered in those bills; manifestly this is quite wrong where the two sets of prices (*i.e.*, the schedule and the bills of quantities) have been prepared by different hands at different times and for different purposes.

What I had in mind, however, was not the use of the War Department Schedule as the basis for post-war contracting. There are other kinds of schedules which I suggest can be used with success as instruments for carrying out schedule contracts. One is the schedule of prices either with approximate quantities or without quantities, prepared *ad hoc* for particular schemes. Such schedules may be priced in competition or issued completely priced, contractors being asked to name their percentage on or off the priced schedule. Another form of schedule is something on the lines of that which has already been published by the Ministry of Works and Planning. This, as your readers will remember, was prepared for use in carrying out building and civil engineering work of a standard type required in the erection of hostels, camps, stores, factories, and similar structures executed within the Government's scheme of building operations connected with the war effort. I suggest that it should be possible, given co-operation between the Ministry of Works and Planning (as representing the Government) and the building industry to produce a schedule of prices for works of simple character, such as housing, schools and other normal types of building, which would form an authoritative basis of pricing projected building work and letting contracts. Such a document might be of great value to municipal authorities and others whose responsibility it is to place contracts for building works rapidly.

Balbus.

To the Editor of *The Builder*.

Sir,—No one will deny the assertion by "Craftsman" (*The Builder*, January 8) that the most satisfactory form of contract is that based upon an accurate bill of quantities, but there are many who will disagree when he says that there is no reason why an accurate bill of quantities should not be produced rapidly—rapidly enough, that is to say, to prevent an initial delay in commencing the building operations for which it is prepared. The reasons "why not" are many, if we go by pre-war standards, and it is little use saying, as "Craftsman" does, that ideas to the contrary must be abandoned. Let us admit, however, that they should be very seriously considered.

The difficulties recognised before the war were: (a) one quantity surveyor could not be expected to "take off" on Standard Method conditions, and taking one trade with another, more than £2,500 worth of work per week; (b) a scheme was rarely found to be cut-and-dried enough to go through a quantity surveyor's hands without a hold-up for consultation with the architect due to insufficient detail or specification; (c) drafting, reading over and printing would occupy the best part of a week, and tendering a further two weeks. Given a £20,000 contract of average complication, and normal staff availability, the resultant of these conditions was that a period of five to six weeks as a minimum would elapse between the arrival of the architect's drawings and the receipt of tenders. (Would it be unkind to mention the further delay often occurring on account of the available drawings being found to be only the "final drafts," and subject to deviation whilst in the quantity surveyor's hands?)

Further, a bill of quantities being a document wedded to the conditions of contract and thereby to the building owner's financial obligations must be turned out with careful regard as much to the wording as to the quantities. "Craftsman" thinks that this is mere routine, but let him think again. He says in his letter, "Any less routine work than preparing a bill of quantities in a proper manner is hard to imagine." The sense of his context, however, indicates that what he meant to say was "Any *more* routine work," etc. Slips of a like nature in a bill of quantities might cost money. Do not smile; I have on record a substantial claim that arose out of those two same words being confused—where "not more than" appeared in a bill instead of "not less than."

The quantity surveyor's work is indeed routine. For that matter so is the architect's and the lawyer's, but that does not mean that a structural design or an action at law can be tackled on "conveyor belt" lines, any more than can taking off quantities for a particular building. Routine turned into specialist practice is very seldom *mere* routine.

There are conditions, it is true, under which but little delay should be experienced in preparing bills of quantities, and those conditions are likely to obtain for a time after the war is won—namely, conditions under which most of the work will be of a standard type (owing to restricted use of materials) and with a major part of the construction and fitment prefabricated. This will be a period of grace for the quantity surveying profession which it should seek to utilise to found itself upon a wider basis, so that it can render worthy service to the industry in the days when the use of materials and labour is no longer restricted by war, and when architecture comes into its own in the re-arising of our public and commercial buildings on the grand scale that it is our hope to see at least commenced in our own time.

C. Q. S.

Scholarships in Architecture, 1943.

To the Editor of *The Builder*.

Sir,—I am desired by my Council again to bring to your notice the following scholarships in architecture tenable at the Architectural Association School of Architecture, London:

COMING EVENTS

Saturday, January 23.

Institution of Municipal and County Engineers.—South Midland Meeting at Middlesex Guildhall, Westminster. 10.30 a.m.

Institute of Quantity Surveyors.—Midlands meeting. White Horse Hotel, Birmingham.

Tuesday, January 26.

Architectural Association. — A Film Evening. Including "The City": Commentary by Lewis Mumford. 34, Bedford-square, W.C. 6 p.m.

Association for Planning and Regional Reconstruction.—Mr. N. Landell on "Estimate for Total Number of Shops." 32, Gordon-square, W.C.1. 5.30 p.m.

Wednesday, January 27.

The Royal Sanitary Institute.—Discussion on "Healthy Housing." 90, Buckingham Palace-road, S.W.1.

National Federation of Building Trades' Employers.—Annual Meeting. Friends' Meeting House, Euston Road. 10.30. a.m.

Thursday, January 28.

Federation of Greater London Master Builders.—Second Annual General Meeting. Speaker: Mr. Ernest Brown, M.P. (Minister of Health). Connaught Rooms, W.C.2. 1 p.m.

Friday, January 29.

Associated Owners of City Properties.—Meeting, followed by Address by Sir Charles Bressey, on "London of the Future." Abercorn Rooms, E.C.2. 12 noon.

Saturday, January 30.

Institute of Quantity Surveyors.—N.W. Branch Meeting. "White Hart" Hotel, Warrington. 3 p.m.

The Leverhulme Scholarship.—This scholarship provides the opportunity for students who could not otherwise afford it to obtain qualifying training over a period of five years for the profession of architecture. It is of the value of £1,000, and its provisions are as follows :—

(1) Payment of tuition fees (£75 per annum); (2) an annual allowance of £10 to cover subscriptions, working materials, etc.; (3) maintenance allowance of £10 per month; (4) an allowance of £20 for travel in the British Isles during the fourth year; (5) an allowance of £40 for travel abroad during the fifth year. Candidates must be of British nationality, must not be below the age of 17 years, and should have reached school certificate standard. They may be required to sit for a written examination on general subjects, and to come before a selection committee for an interview.

The Minter and Sir Walter Lawrence Open Entrance Scholarships.—These scholarships, value £75 12s., entitle the holder to free tuition for the first-year course at the Association's School of Architecture, and they are open to candidates who are under the age of 19 years on July 1 of the year in which they compete.

All entries must be accompanied by a portfolio of drawings, and must reach the Secretary of the Architectural Association, 36, Bedford-square, London, W.C.1, on June 1 in each year in the case of the Leverhulme Scholarship, and on July 1 in each year for the Open Entrance Scholarships.

Application forms and further particulars may be obtained from the Secretary of the Association, to whom all communications should be addressed.

ARTHUR WM. KENYON,
President.

34-36, Bedford-square, W.C.1.

"The Builder" Centenary.

TO THE EDITOR OF *The Builder*.

SIR,—I should like to add my congratulations to the many that you have received upon *The Builder's* attainment of its Centenary. My own recollection of the paper goes back nearly fifty years when, as a boy, I was permitted to look through it, and I remember the most exciting of its contents to me, then, was the illustration to the advertisement of a steeplejack. My later interest became more discerning, and the impression left upon me by many years' reading is of its consistent rationality both in matter and make-up. Its steadying influence will, I think, be as much needed when peace comes as it was in the first years after the Kaiser's war, when an exaggerated value was often placed upon what was new, just because of its freshness.

L. E. WALKER,
Kerner-Greenwood and Co., Ltd.
King's Lynn.

The Royal Gold Medallist.

TO THE EDITOR OF *The Builder*.

SIR,—There are two Faculties at Liverpool University which have become world-famed—one in the field of medicine, the other in the field of art. The School of Tropical Medicine and the School of Architecture respectively have for many years established themselves as the leading centres of education in each particular Faculty.

The fame of the School of Architecture would always be linked up with the name of C. H. Reilly. Before this architectural personality came to Liverpool the School was hardly "on the map." It was not long before Professor Reilly, equipped with dynamic energy, enthusiasm and profound learning, infused new life into a dying institution. In a short period the prestige of the School rose from the lowest rung of the ladder to the top.

The Professor's remarkable aptitude for enthusing students in their studies is without parallel, and I often thought he must have possessed a magic wand, so astounding were the results.

Brilliant successes from students in their second and third year became a common occurrence, and when the Rome scholarship was founded a Liverpool student barely twenty-one carried off the coveted honour and became its first winner. Such an achievement had a magnetic influence on this "Mecca" of architecture, and as years went by this "blue riband" of scholarships was carried off time after time by candidates of the Liverpool School.

Not only in quality but in quantity did the work of the School progress. With its reputation established, students flocked from countries far and wide, and soon it became the most cosmopolitan architectural training ground in Europe.

Throughout Professor Reilly's long career Liverpool set the standards in modern design, and architects year after year clamoured for the latest edition of the Liverpool sketch book as their guide and inspiration.

Changing architectural phases did not deter the School from keeping abreast with the latest movements in design, as witnessed by those fine exhibitions of the students' work held annually at the Walker Art Gallery, Liverpool.

Students who were fortunate to study during the régime of Professor Reilly will always owe to him a debt of gratitude, for his influence was profound, not only æsthetically but also practically, for to-day many of the "plum" posts in the profession are held by the professor's old students.

No more deserving recipient has ever been chosen for the Royal Gold Medal, the highest honour that the Royal Institute of British Architects can bestow. It has this time, in 1943, been awarded to a fine propagandist and critic, a brilliant journalist, a pioneer in architectural education, and last but not least a great artist in the truest sense of the word.

GORDON HEMM
(a former Student).

Holidays with Pay.

TO THE EDITOR OF *The Builder*.

SIR,—The letter from Mr. F. Norman headed "Holidays with Pay," in your issue of January 8, involves several misconceptions of a fundamental nature. Perhaps the following statements may assist your readers to understand the true position :—

(1) The holiday stamps are not cash, but their receipt by the purchaser is itself acknowledgment that he has paid the cash, in the same way as the Government stamps are purchased.

(2) Means have been adopted which render the chances of successful forgery at least as remote as in other cases where official stamps are sold and official cards issued.

(3) The money paid for stamps, less the small charge of 6d. per operative per annum, is entirely repayable in benefit. Even this small charge may disappear if it were found that investment income met the expense of administration, but obviously there is no investment income at the start.

(4) The guarantee of good faith is that the Employers' and Operatives' National Organisations in the two industries (building and civil engineering) have taken the most meticulous steps to ensure that the scheme shall be administered with complete honesty and in the general interest. The members of the Company and of the management board are all appointed by, and responsible to, those organisations acting jointly. In addition, there is an independent chairman of the management board, an eminent past-president of the Institution of Civil Engineers, Sir Clement Hindley, K.C.I.E.

(5) The composition of the board of management is as follows :—

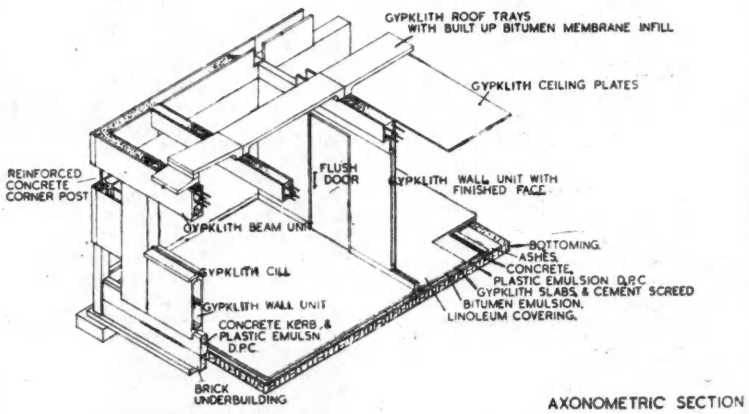
On behalf of the N.F.B.T.E.—Mr. G. H. Parker, C.B.E. (George Parker & Sons, Ltd., London); Mr. W. H. Forsdike (W. & A. Forsdike, Ltd., Sheffield); Mr. F. Leslie Wallis (G. E. Wallis & Sons, Ltd., London and Maidstone).

On behalf of the F.C.E.C.—Mr. Howard Farrow (Howard Farrow, Ltd., London); Mr. A. M. McTaggart (Balfour Beatty & Co., Ltd., London); Mr. B. J. Meighan (Ruddock & Meighan, Ltd., Wealdstone).

On behalf of the N.F.B.T.O.—Mr. R. Coppock, C.B.E.; Mr. L. Fawcett, O.B.E.; Mr. J. W. Stephenson, J.P.

On behalf of the C.E. Operatives.—Mr.

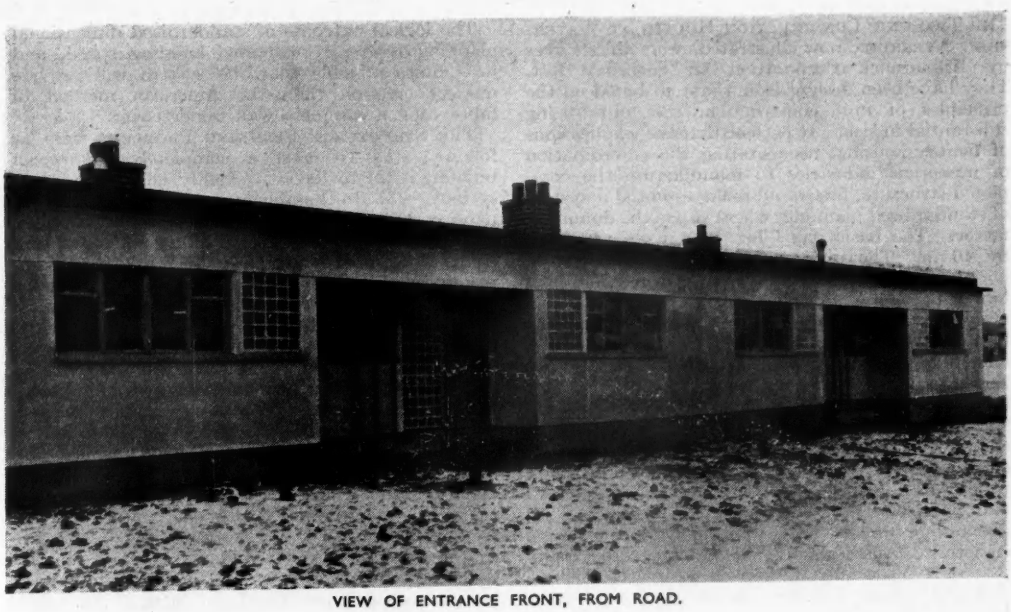
(*Continued on page* 92.)



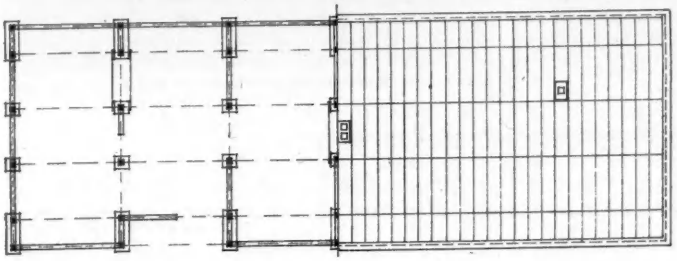
AXONOMETRIC SECTION

TWO UNIT-BUILT HOUSES IN AYRSHIRE:

(SEE FACING PAGE).



VIEW OF ENTRANCE FRONT, FROM ROAD.

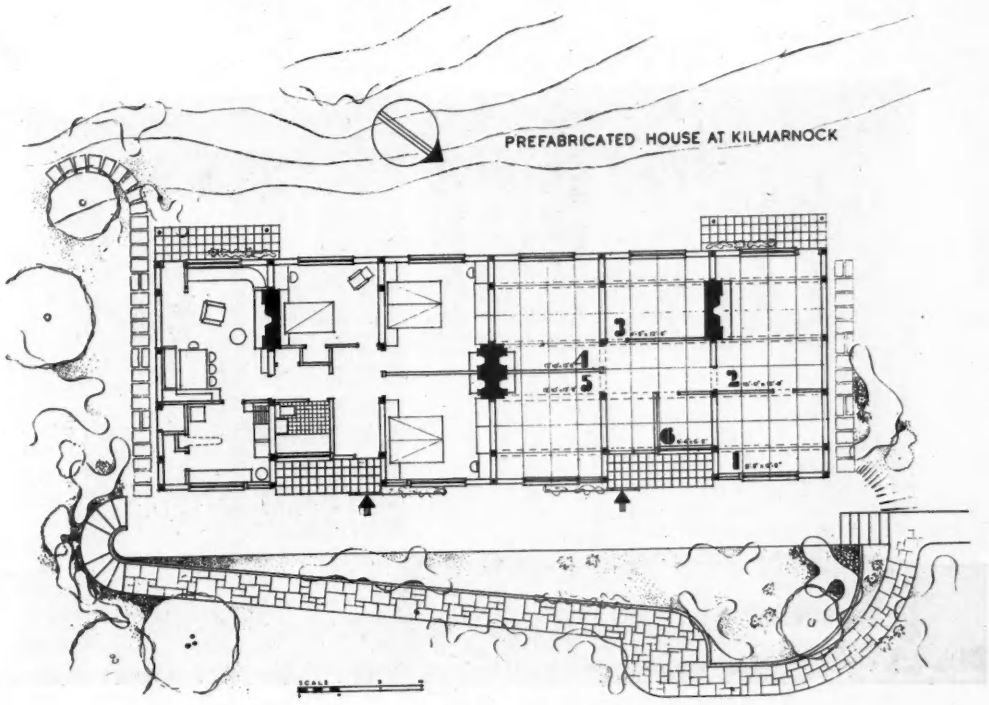


FOUNDATION ROOF

FOUNDATION AND ROOF PLAN.

UNIT-BUILT HOUSES IN AYRSHIRE

MR. SAM BUNTON, L.R.I.B.A., A.R.I.A.S., ARCHITECT.



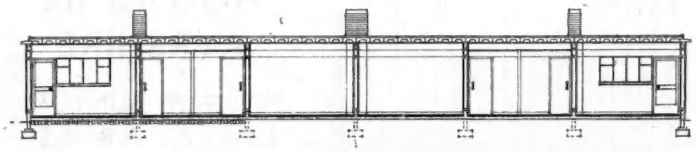
PLANS.

THE TWO UNIT CONSTRUCTION HOUSES AT WATERSIDE, AYRSHIRE, now illustrated, were taken over by Kilmarnock Corporation on Saturday last. They have been designed on a system based on the principles of unit construction, the units being substantial in size. It is clear that the implications of factory-housing, necessitating the co-ordination of numerous industries to manufacture the completed structure, first of all make essential a system of standardised planning, where size is the dominant factor. The basic panel has been fixed at 80 in. by 40 in. The unit can be used vertically and horizontally, and provides a large degree of flexibility in planning. Everything conforms to a 40-in. grid. Some people infer that this apparent limitation results in restricted design, but study and practice have revealed that this is not so. The ease and flexibility with which subsidiary industries can function satisfactorily, based on standardised planning, have been amply proved in the first demonstration at Kilmarnock; and no explanation is needed of the speed and precision which will result from the establishment of standard plumbing, electrical and finishing components, all dovetailing into the basic wall, floor and roof units. If detailed consideration is also given to the many materials—especially those from the plastics field—and studied in relation to the factors, further benefits are apparent, since man-power will be enabled to work rapidly quite regardless of the type of material, and by virtue of the fact that all have been fabricated to a common size. This is rather an important point.

The logical outcome of standardised dimensional planning is greatly increased building speed, and it is quite possible that the system will provide quicker erection than the American method of fabricating a complete wall under cover.

THE STRUCTURAL PLANNING PROBLEMS were as follows:—(1) To erect a completely waterproof building; (2) to devise a highly efficient jointing system; (3) to establish a sound type of expansion jointing; (4) although light for handling by man-power, to have great rigidity and stand firm against the most abnormal gales; (5) to be completely insulated and, indeed, achieve an advance in this connection; and (6) to be absolutely practical from the viewpoint of construction, planning, living-space and the provision of essential equipment.

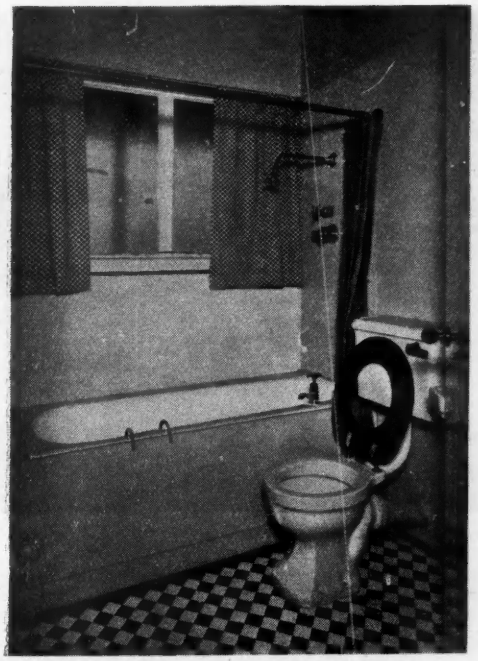
The structural material selected was "Gypklith," which has qualities of sound insulation and absorption, thermal insulation and resistance to fire. The fabric of the structure consists of the following prefabricated units:—*External wall panels* are 80 in. by 40 in. by 8 in., the outer and inner faces being 1 in. thick, finished externally with "Mortone" rendering and internally with one coat of "Cretestone" plaster. The *internal cross-wall panels* are exactly similar, except that both faces are finished with one coat of "Cretestone." These units are of hollow construction, the faces being 1 in. thick with a 6-in. hollow core. *External wall beam units* are 80 in. by 20 in. by 9 in., internal and external faces again being 1 in. thick, finished on the outside with "Mortone" and internally with "Cretestone." *Internal cross-wall beam units* are similar,



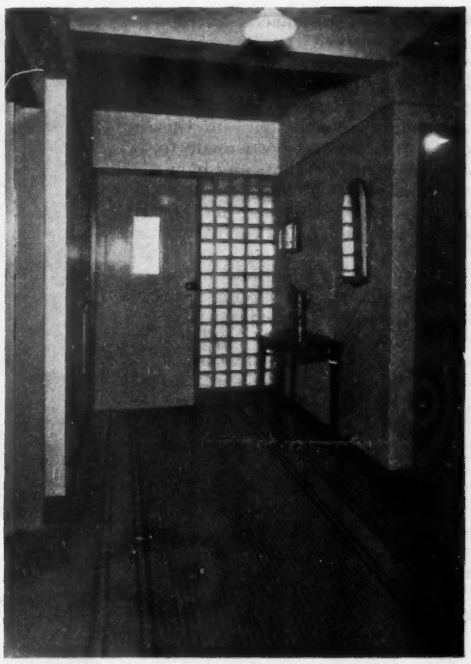
Left: LONGITUDINAL SECTION.

Below: DETAIL OF PORCH, SHOWING GLASS-BRICK WING LIGHT.

UNIT-BUILT HOUSES IN AYRSHIRE.



THE BATHROOM : NOTE SHOULDER SPRAY AND ABSENCE OF EXPOSED PIPING.



THE ENTRANCE HALL, SHOWING FRONT DOOR AND EFFECT OF WING LIGHT.

but with both faces finished with one coat of "Cretestone." The *partition wall panels*, 80 in. by 40 in. by 4 in., are finished with one coat of "Cretestone." These units are of hollow construction, both faces being 1 in. thick with a 3 in. hollow core. *Roof "Tray" units* are 80 in. by 20 in. by 6 in., manufactured in hollow tray form and processed in the factory with bitumen emulsion and cover membranes overlapped at ends and sides. *Floor units* are 80 in. by 20 in. by 6 in., and are manufactured in hollow-tray form, supported at 40-in. intervals by sleeper walls. *Plinth and parapet courses, sills and longitudinal tie beams* are also made with "Gypklith" in consonance with the basic unit.

METHOD OF ASSEMBLY.

The external and cross-wall slabs are set on a cast *in situ* kerb. An impregnated bitumen emulsion strip is applied to each joint together with an application of cold-setting bitumen carefully keyed, and recessed. These processes occur at all vertical, horizontal and roof joints; and thereafter are carefully pointed with "Cretestone." Consequently the structure is plentifully supplied with expansion joints. The internal partitions are set on subsidiary precast concrete kerbs, suitably profiled to receive the checked soffits of the wall slabs and are jointed together. The roof "trays" jointed as previously described, are finished with a bituminous sealing coat which takes very little time. The underside of the roof trays are lined with "Gyproc" to form ceilings. Entrance hoods are 2 in. slabs screeded with cement and keyed into 20 in. square. For the flower-boxes, 2 in. slabs are used from 20 in. widths.

INSTALLATIONS.—*Electric*: Most of the tubing and wiring has been installed in the factory, and it may be stated that under perfect conditions almost all of this work would be done before site delivery.

Plumbing: The one-stack plumbing system has been introduced, and a very compact working unit is satisfactorily operating. An outstanding feature is the provision of a shoulder spray for the bath.

Structure: The entire structure is bound together with reinforced concrete columns, longitudinal and cross beams. All except the longitudinal beams are concealed within the "Gypklith" panels. The wall and beam panels are cast with projecting nibs which, when meeting, provide the closures to receive the concrete. In this way the entire structure becomes completely homogeneous and possesses great strength. By simple adjustment of the cavity space to increase the size of columns, the system can without the slightest difficulty be applied to the construction of multiple-storey flats. There is, consequently, no limitation of building height.

FINISHINGS: 95 per cent. of the finishing has been carried out in the factory. New finishes are envisaged from the plastics and asbestos industries, and such will probably be incorporated in further projects. In this case the internal slabs were coated with plaster and received a decorative finishing coat in the factory. The external wall faces were rendered with "Mortone," which can briefly be described as a factory-made mixture providing protective and decorative external and internal surfaces. The finish is water repellent, hard, durable and, most important of all, shows remarkable freedom from crazing. The mixture was applied by hand machine, and after erection and jointing, all that was necessary to finish off was a quick cover coat.

In regard to these applications, the site operations necessary have proved to be filling and flushing at joints; and it has to be recorded that the patching due to breakage in transport was no more than that necessary in a normal structure. It can certainly be stated that these methods will be replaced by a slab, complete with finished external and internal faces, and a reinforced edge to prevent breakages; all produced as a precise building component. Glass bricks have been introduced in certain places with good effect.

UNIT-BUILT HOUSES IN AYRSHIRE.

FIREPLACES: Fireplace construction has received guidance and direction of Mr. Alexander Dunn, Uddingston, near Glasgow, who has carried out extensive tests, research and development in this field. An effort has been made to combat sluggish draughts and blow-down, and the following procedure has been adopted—based on Mr. Dunn's suggestions, and carried out by his firm.

To ensure a steady flow of air to the chimney, the living-room fireplace has been fitted with an auxiliary (air supply unit) which is equally suitable of application to the metal basket or the sunk fire type. The living-room unit was prefabricated in one piece. It has been built on the most modern method. All projecting ledges have been avoided to permit a free flow of air, and special care has been applied to the elimination of oncome pockets. A system of vent contraction, commencing at lintel evel, has been introduced. The fireplace is sunk and finished level with the hearth. A rectangular air heating chamber is introduced directly under the fire well and is divided by baffle plates. This chamber has an upward extension close to the outside edge of the well, covered by a perforated plate. The fire-box is connected to the outside atmosphere by means of an air duct running through the floor. Consequently, the fire can draw air independent of conditions internally. The recesses of the fire-opening have been insulated against heat loss to a height of 24 in. The bedroom fireplaces have been built in similar manner to the living room, although they are of the all-tile type with patent Blaikie bull-nose to fire.

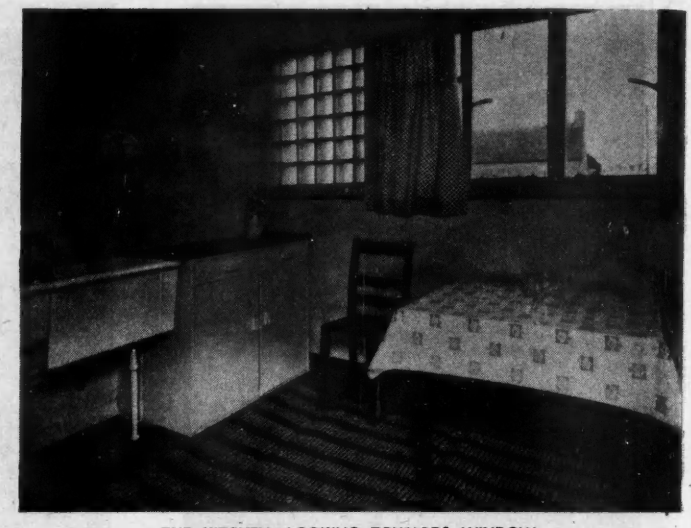
ERECTION: At Kilmarnock speed was regarded as relatively unimportant; what mattered—very naturally—was technical and practical efficiency. Glasgow contractors were employed.

It has been estimated that a squad of 500 men—covering all trades—could erect 50 complete houses per week on prepared foundations, ready for occupancy within two weeks of work beginning. A project of 2,500 to 3,000 houses could be completed, with this volume of labour, within twelve months, irrespective of weather, since variations of the system permit the erection of the roof at an early stage, thus allowing operatives to work under cover.

The "Gypklith" and "Gyproc" materials used are manufactured by Gyproc Products, Ltd.

TWO UNIT-BUILT HOUSES, AYRSHIRE.

MR. SAM BUNTON, L.R.I.B.A., A.R.I.A.S., ARCHITECT.



THE KITCHEN, LOOKING TOWARDS WINDOW.

ANOTHER VIEW IN KITCHEN, SHOWING SINK UNIT.

THE LIVING-ROOM.

STRUCTURAL PLASTICS

By T. WARNETT KENNEDY, A.R.I.A.S., D.Arch.(Glas.).

Introduction.

CLAIMS have been made both in the plastics and building industries that synthetic resinous materials are capable of carrying structural loads, and merit consideration as new materials of construction. On the face of things it would appear that this is so. Such investigations as have been made, and these are all too scant, show that as facts are interpreted to-day the limitations are considerable. It would be a bold man, however, who would assert that the difficulties encountered are intrinsic and incapable of solution. Indeed, it can be said that the use of structural plastics has already been demonstrated to a limited degree. When one refers to plastics in a structural sense the term includes both resin and filler, and the filler material may vary—*e.g.*, fabric laminations, paper, felt, woven cord and wood veneer fillers all having varying mechanical strengths and varying resin contents. At the latter end of the scale the proportion of wood to resin in terms of percentage content of the composite plastic becomes so disparate that one ceases to think of the problem as structural "plastics," but rather as a development of wood technology.

Materials of this nature developed to date have extensive structural applications, but it is only when one comes to make direct comparisons with metals for full structural application that the differences become obvious.

Such investigations as have been made are prefaced by assumptions and provisos which cannot remain unchallenged. In effect, they result from direct comparisons between plastics and metals or plastics and wood, assuming that the constructional techniques by which plastics will find expression in building will be much the same as for steel and wood. So it is that Building Research Station tests are based on the assumption that "plastics must serve as tensile materials and bear comparison with wood and steel if they are to find any considerable structural use," or "that there would be no point in requiring plastics to fulfil the functions of stone, brick or concrete."

On these doubtful assumptions the B.R.S. have succeeded in proving that "plastics have no specially favourable properties that would counterbalance their relatively high cost," or "the mechanical properties will need to be improved if plastics are to be used as load-bearing materials." A careful proviso is added that "British Standard I-Sections may not represent the ideal form for a plastics beam to take; a somewhat more efficient shape might be worked out for particular types and introduce small modifications in the figures cited."

Straight Comparison with Steel Joist.

Almost all the assumptions made are open to contradiction. Let us start with the cautious proviso, and perhaps it may help us to see that until we have found the ideal form for a plastic structural member to take, we are not in a fair position to make comparisons. Starting from the figures published for Gordon Aerolite, which are :—

Tensile strength	...	45,000 lb./sq. in.
Compression strength		24,000 lb./sq. in.
Mod. of elasticity	...	6.0×10^6 sq. in.
Shear strength	...	5,000 lb./sq. in.
Specific gravity	...	1.43

We can consider a beam of 10 ft. span, simply supported, to take a load of 9.6 tons evenly distributed. (Bending moment = 12.0 ft. tons.)

The steel beam necessary to carry this load with a maximum deflection of 1/325 of span would be 9 in. x 4 in. x 21 lb. I. Consider now a plastic beam (Gordon Aerolite), Fig. 1, to carry similar loads and retain the deflection limits given.

Elasticity of plastic

$$\text{beam} = 6{,}000{,}000$$

Elasticity of steel

$$\text{beam} = 30{,}000{,}000$$

Inertia of 9 in. x 4 in.

$$I = 8.1 \text{ in}^4$$

$\therefore$ Inertia of plastic

$$\text{beam} = \frac{81.1 \times 30}{6} = 405 \text{ in}^4$$

to retain same deflection.

Compressive stress in plastic beam = 5,500 lb./sq. in. $\therefore$ factor of safety = 4.4.

Tensile stress in plastic beam = 9,400 lb./sq. in. $\therefore$ factor of safety = 4.8.

Weight of plastic beam = 5 lb./lin. ft.

Approximate cost of steel section = £20 per ton or 2¼d. per lb. or 4s. per lin. ft.

We can, therefore, say that this particular plastic material would require to cost approximately 9¾d. per lb. to compete with steel in cost, and would assume the profile shown to perform the same structural function. No costs are available for Gordon Aerolite, however. Paper base laminated plastic material can be taken at 1s. per lb., and fabric base laminated at 2s. per lb. Gordon Aerolite would certainly cost more at present if available, but it would be useless to continue striving for a cost comparison because techniques for the mass-production of structural plastic sections, to the writer's knowledge, have never been attempted.

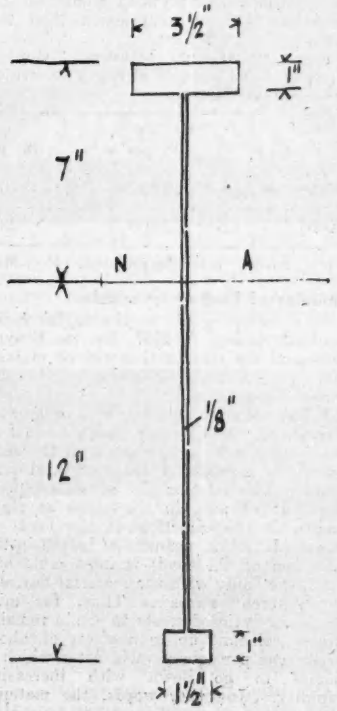


FIG. 1.—A PLASTIC BEAM (GORDON AEROLITE)

New Techniques.

So far our example has been a direct comparison between steel and one particular plastic used in the conventional manner—that is, as beams. We are now tempted to draw certain general conclusions.

1. That a plastic beam designed to carry equivalent loads to a steel beam results in a profile to which we are totally unaccustomed. But this profile in itself is suggestive of the general reform of structural technique, necessary if plastics are to be applied economically.

2. For instance, the profile shown might well be amended to show a double web instead of a centre web, and become in effect a wall section, such as might be required for a broad lintol. In this event, the wall-cum-beam may have insulating infilling for this particular application.

3. Carrying this conception into the design of floors, we may intelligently visualise a diagrid form of bracing with a top and bottom skin integral with the bracing and acting structurally as extended flanges. The total floor, therefore, constructed as described, can be thought of in terms of a "cellular monolithy."

4. Just as the term "cellular monolithy" embraces both floor beams and floor slabs in combination, acting together, we can imagine the distinction between walls and floors as separate elements becoming obsolete, and a combined wall-floor form of cellular monolithic construction replacing it. Who can say where this may lead? Sufficient it is to demonstrate that structural plastics essentially imply new design techniques, and that straightforward comparisons between plastics and orthodox materials are both naïve and misleading. It would seem anomalous to expect plastic beams to support brick walls just as a time may come when the use of crude steel and r.c. sections for domestic structures will appear as outdated and clumsy as did cast iron at an earlier period.

Plastic Concrete?

Referring now to the statement that "there would be no point in requiring plastics to fulfil the functions of stone, brick or concrete," one is tempted to ask, "Why not?" Patents are continually being lodged, purporting to show how plastics can be used in the manufacture of synthetic stone, and the exhibition plastic house at Frankfurt had walls of a synthetic concrete or light stone consisting of blast-furnace slag bound in urea-formaldehyde.

It might be interesting to follow up the analogy between a "plastics concrete" and a "cement concrete." If plastics are admittedly nonductile in character and have a low modulus of elasticity, it would seem logical to compare them with building materials in the same category. It would appear that investigators have been led to follow up the plastics-metal comparison through the attraction of the good figures quoted for tensile strength in numerous plastic composite materials. Perhaps the tensile qualities have served as a red herring to mislead us.

Thermo-setting resins are intrinsically stronger binders than cements, and while

the cost comparison is distinctly unfavourable one should remember that recent research is enabling us to envisage inexpensive cold-setting phenol and cresol-formaldehyde emulsions, which may help in levelling out the first crude cost comparison. Furthermore, in making up a plastics concrete mix it would be possible to use lightweight aggregates and industrial wastes in place of sand and gravel, which in addition to being heavy entail high transport costs on this account. One is tempted to visualise plastic beams consisting of a lightweight plastic-bound concrete, having exceedingly high insulation qualities, reinforced with metal rods in the usual manner. It is not suggested that *in situ* work be considered, but in highly standardised prefabrication schemes one might find advantages in having factory-made precast columns and beams using plastic-concrete. In this way the deadweight of the structure itself would be improved, and reinforced floor slabs would have added qualities of insulation (sound, heat and vibration), and would be directly nail-holding without the necessity of designing special clips and fixings for wallboards as is normal to-day.

It is known that the theoretically correct shape of a steel joist or a concrete beam is markedly different from the shapes in common use. Hitherto, it has been uneconomical to eliminate the useless material either by cutting the web or flanges of a rolled steel joist or making specially shaped shuttering for a concrete beam. In a factory-made repetitive element, however, these economies might be effected with advantages in cost. It is certainly the case that the economics of plastic structural sections must take into consideration the indirect savings accruing through their excellent strength-weight ratio and consequent speed of erection without complicated tackle and other savings implied by ease of fixing and absence of special measures to combat poor insulation, condensation, etc.

These viewpoints are, however, highly conjectural, but serve the purpose of dispelling the tendency to make too direct comparisons between plastics and metals and omitting other promising lines for development.

Other Advantages of Plastics.

Referring back again to the statement that "Plastics have no specially favourable properties that would counterbalance their relatively high cost," it is difficult to see how such a viewpoint can be maintained. One might be more readily pardoned for asserting that the contrary is the case. It is beyond the scope and intention of this article to stress the non-structural advantages which result from cellular monolithic constructions, but it may be worth while to note that the conventional distinctions between skeleton and cladding disappear as their separate functions fuse into the total construction, a result made possible by recent developments in plastics moulding and gluing techniques. Furthermore, it is characteristic of the proposed plastic materials, whether "Gordon Aerolite" resin-bonded plywood or similar materials, that they possess the properties of high-weather resistance, low thermal conductivity, decorative possibilities, and can be made fireproof. They are also proof against corrosive action.

Patents.

Valuable work has been carried out in this country by Dr. N. A. de Bruyne on plastics structural materials, and his "Gordon Aerolite" referred to above (British Patent 501,649 (1939)) describes a method of overcoming the difficulty of manufacturing lengths or planks of high tensile material of greater lineal dimensions than could be normally obtained in a conventional hydraulic press, that is, above 8 ft. in length. In this method the impregnated reinforcing material—that is, textile fibres such as flax rove—is fed into a press in such a way that the pressure is applied intermittently and the finished material emerges in indefinite lengths depending upon the linear dimensions required. In another De Bruyne patent (B.P. 470,331 (19396)) the reinforcing fibres are "pre-stressed."

Strength-weight Ratios.

It has been contended that direct comparison between metals and materials such as "Gordon Aerolite" or "Duramold," which consists of mahogany veneers resin-bonded with P.F. plastic glues, are misleading. If the ratio between the physical strengths and the specific gravities is taken into consideration the comparisons are more favourable.

According to Alfred A. Gessner, Chief Engineer of the Haskelite Manufacturing Corp., who handle all applications of "Duramold" other than for aircraft purposes, this strength-weight ratio is an important consideration. He says: "A thick skin of 'Duramold' is by itself able to carry large compression, shear or tensile stresses because of the comparatively low density of the material. The specific gravity of mahogany base 'Duramold' is 0.52, compared with a specific gravity of about 2.80 for aluminium alloy. The skin thickness can, therefore, be about 5.4 times the thickness of such a material for the same weight."

In compression-buckling the determining factor is the E.I value, or the product of the modulus of elasticity times the moment of inertia of the member. For aluminium alloy E = 10,300,000 lb./sq. in., for mahogany base "Duramold" E = 1,100,000 lb./sq.in. But the moment of inertia I is equal to "t" 3/12 for unit length, and the thickness "t" for "Duramold" can be 5.4 times the thickness of the aluminium alloy plate. At the same weight the plastic-plywood would be 2.5 times stronger in compression than the metal.

The comparisons between "Gordon Aerolite" and steel on strength to weight basis are as follows:—

Material.	t/p (lb. per in.²)	c/p (lb. per in.²)	E/p (lb. per in.²)	S/p (lb. per in.²)
Gordon Aerolite	31.500	16,800	4.20×10^6	3,490
Steel	23,100	23,100	3.85×10^6	13,500

t = tensile. c = Compression. E = Mod. of Elas. S = Shear. p = Spec. Grav.

Modulus of Elasticity Variable.

In a lecture given to the Royal Aeronautical Society in 1937, Dr. de Bruyne discussed the structural merits of plastics and in particular his own "cord reinforced" materials.

"The ultimate tensile and compressive stresses at which failure occurs are not in themselves sufficient measures of the suitability of a material for structural purposes. The relationship of stress (load per unit of area in the plane at right angles to the direction of the load) to strain (deflection per unit of length in the direction of the load) is important, and varies not only with the material but also for different stresses. Thus, for mild steel, the ratio of stress to strain remains nearly constant up to a stress of about 17-18 tons per square inch, after which it begins to go down with increasing rapidity. In other words, the material stretches more rapidly until it fails altogether at a stress of about 30 tons per square inch. This ratio is known as Young's Modulus or the Modulus of Elasticity, and has a value of about 30×10^6 per sq. in. for most steels up to the limit of proportionality.

"It is characteristic of synthetic resinoids that the value of Young's Modulus is not the same in compression as in tension (in metals the same value is usually assumed for both), and, further, that it varies throughout the range of stress. It is, therefore, extremely difficult to define. De Bruyne quotes a value of 2.0×10^6 lb. per sq. in for cord aerolite up to 2.0 per cent. strain. Comparing this with duralumin at 10.5×10^6 (sp. gr. 2.85) and steel 30×10^6 (sp. gr. 7.8) we find the following order of merit: Steel, 3.84; duralumin, 3.72; cord aerolite, 1.49. In other words, the resinoid wing or fuselage when under load in flight or on the ground will deflect perhaps twice as much as the metal one. But, unlike steel, cord aerolite has already been shown to have a Young's Modulus which is amenable to treatment in its manufacturing stages. Increasing the moulding pressure increases not only the value of Young's Modulus, but also the ultimate strength. Similarly the type of reinforcement used and the relative proportions of reinforcement and resinoid have a profound effect on the strength, whether this is measured in terms of ultimate failure or in terms of deflection under load."

Marcus Langley, of the British Aircraft Manufacturing Co., Ltd., writing in "British Plastics," July, 1937, gives the following table of strength/weight ratios for various materials:—

Material	Tensile Strength/ Specific Gravity
Spruce	25,000
Duralumin	21,700
H.T. Steel	15,800
P.F. Laminated Paper	13,950
P.F. Laminated Fabric	7,250
Perspex	6,600-7,500
U.F. (paper base) ...	4,760-6,540

Material	Compression strength/ Spec. Gravity
P.F. Laminated (Fabric)	29,000 (flatwise)
P.F. Laminated (Paper)	22,000 (flatwise)
U.F. Paper Base ...	17,000-19,600
H.T. Steel	12,800
Spruce	12,500
Duralumin	11,800

"It becomes apparent that whereas the plastic materials already lead in compressive strength, they lag behind in tensile strength, weight for weight. Nevertheless, in this respect, P.F. Laminated paper is nearly of the same strength/weight value as high-tensile steel, although it was not developed specifically for structural purposes."

Selecting a Material.

The selection of a new material for structural purposes is influenced by many factors other than those of strength. One might mention the following:—

(1) Durability; (2) corrosion resistance, including cost of measures for protection from atmospheric action, if such are necessary; (3) fabrication techniques—speed of shaping and machining and cost of equipment and tools; (4) availability of raw materials, sources, transport costs, regularity of supplies; (5) cost of raw material, cost of labour in the particular industry.

Some of these factors are apt to be regarded as constants, such as the physical properties of the material, but the pace of development is such that no factor can be considered fixed. A technical advance on the "molecular structure" may have far-reaching consequences. Research into working methods and the emergence of new human needs may be equally the cause of vigorous development. One is forced to conclude that if these factors are considered when assessing the claims of plastics for use as structural materials no assessment can be final, and that any opinions for or against can only be interim in character.

When comparisons are made with metals, it is apparent that each investigator chooses his plastics material in an arbitrary manner, and the term "phenol-formaldehyde laminated paper" or "resin-bonded plywood" can mean any one of hundreds of commercial grades, and new types are continually appearing on the market. This confusion will, of course, be remedied in time through the rationalisation which will take place as a result of the renascent activities of the British Standards Institution.

Materials Designed for Purpose?

So far we have examined known plastic materials against the background of existing knowledge of structural mechanics. It is becoming increasingly possible, however, to reverse the process and postulate the chemical and physical structure of a hypothetical material to meet given conditions. This becomes partially possible as exact knowledge comes to hand, both of the molecular structure of the binding resin and the length, strength and correct orientation of fibres and laminæ to give maximum strength in the desired directions. The position is directly analogous to that which has obtained in the development of metallic alloys over the last quarter century. A bewildering array of new grades of alloys, each having their own unique features or physical properties, were produced. Now, however, the main physical properties can be varied at will within the boundaries of their known limitations, and it is possible to produce the correct material to meet any clearly stated set of conditions.

Certain basic features of plastic materials, such as low thermal conductivity, are being consciously modified. Experiments have been made, for instance, in the use of powdered metal fillers, and the electrical insulation qualities of plastics have been modified and reversed by a process of surface-spraying with zinc. Similarly, we can reasonably anticipate an attack upon the problem of increasing the modulus of elasticity of "structural" composite materials, a problem which is subtly bound up with that of improving the property of ductility. This is obviously a matter of fundamental research by the chemist, and an architect's comments on the subject are worthless except to emphasise the desirability of this type of research.

Future Possibilities.

As one studies the chemistry and physical structure of woods, plastics and metals, one gets the sense of an ultimate unity and that the paths of research, apparently so dissimilar, are converging on this point. The boundaries between wood and plastics and plastics and metals become hazy and indeterminate, and the feeling grows that a gigantic jig-saw puzzle is being pieced together. Our minds are so constructed that we tend to over-simplify our problems, but we are coming to see scientific research as an advancing front rather than a series of unrelated personal thrusts into the unknown. It may be, therefore, that the development of structural plastics in the full sense will proceed slowly through the interaction of advances made on widely different aspects of the same problem. Moulding technique, for instance, although not so fundamental as chemical research, is advancing to a point where it becomes possible to foresee the economic production of large structural members and in this way stimulates research work on the intrinsic physical properties of synthetic resinoids and their reinforcing fillers.

PLASTICS AND PHOTO-ELASTICITY.

Some reference to the value of plastics as a medium for analysing stress distribution in structural frames by photo-elastic methods is perhaps relevant. Attention is drawn to the work of Robert W. Vose, of the Massachusetts Institute of Technology, A. G. Solakian, R. B. Carleton, John Delmonte and the Land-Wheelwright Laboratories of Boston, Mass.

The photo-elastic method has been known to civil and structural engineers for some time, but early researches proved difficult owing to the limitations of the material used for the fabrication of models, that is, glass. Now, however, plastics have entered the field and work has been carried out using clear cast phenol-formaldehyde, celluloid and cellulose acetate, acrylic and vinyl resins.

Structural engineers compute and analyse the stresses in a framed structure by mathematical formulas which are necessarily average rather than exact assessments. Through practice and empirical experience a good engineer has a mental picture of the behaviour of his material, but as the structure becomes more complex the interaction of forces and the formulæ which express them become equally complex and therefore subject to a greater risk of miscalculation. One finds in pre-war practice, therefore, a tendency to play safe, with the consequence that the design is spendthrift in the use of material, the factor of safety becomes large and uneconomic and, perhaps what is more dangerous to progress, a body of calculators arise who design by formulæ only, and lose the flexibility of design which is the resultant of a true appraisement of the nature and degree of the forces at work.

During war time this tendency has been largely offset by the urgent necessity of economising in material and engineers who formerly strove for a design which represented the maximum of material allowable within the limits set by competition for contracts, together with the minimum of labour expended both in the drawing office and fabrication processes, have been obliged to pare down in the national interest. The beautiful and delicate designs which have appeared in recent years come as a shock to the poor trusting architect, who imagined that he was the only person in the building industry who was formerly guilty of the unscientific approach to structure.

Now that the "cat is out of the bag" it is difficult to see how the structural firms, who were formerly dependent for profits largely on the tonnage of material used, will be able to revert to pre-war design and we may anticipate that development of the photo-elastic method of computing stresses will come into general use.

The theory behind this method has been simply explained by John Delmonte as follows:—"The photo-elastic method of analysing stress distribution utilises transparent plastic models, constructed to exactly the same form and scale as the proposed metal structural part. The plastic models are subject to stress as would be the metal members, and, by analogy, the stresses in the proposed design are arrived at, qualitatively and quantitatively. The stress distribution is independent of the material used, within certain limits, up to the elastic limit of the material. The application of stress to a transparent plastic medium induces temporary double refraction, which is manifested optically when the medium is viewed with polarised light. Light travels as a wave motion, vibrating in all directions in planes at right-angles to the direction of the beam. A polarising plate or special crystals polarise the light in one plane of vibration, which on passing through the stressed transparent member, divides into two systems of transverse waves, because of the double refraction. On passing the light through an analyser two trains of unidirectional waves emerge, which are out of phase with each other and cause the interference effects, which are viewed as fringes or stress patterns upon the viewing screen or photographic plate. When using monochromatic light this effect is observed as light and dark fringes, while white light will give brilliant colours, not so well defined as the alternate fringes. These interference fringes are used in determining the stress distribution and concentration." (See Figs. 2 and 2a.)

These photo-elastic studies were taken at the Massachusetts Institute of Technology photo-elastic laboratory, under the supervision of Mr. Robert W. Vose. The stress pattern allows a two-dimensional

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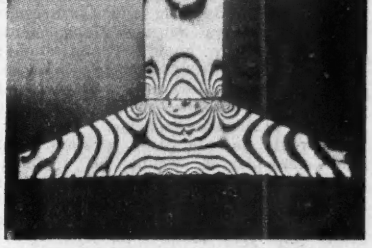

FIG. 2.—SECTION OF WALL FOOTING ON SOIL PRESSURE. THIS SHOWS LINES OF EQUAL STRESS IN A MODEL OF A WALL FOOTING RESTING ON SOIL PRESSURE AND SUBJECTED TO A VERTICAL LOAD ON TOP OF THE WALL SECTION.

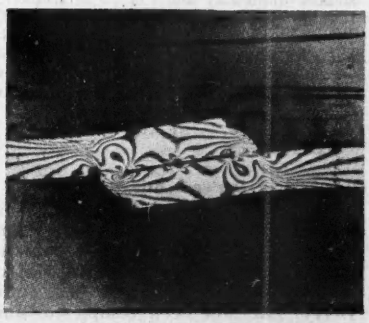

FIG. 2a.—SECTION OF LAP JOINT WITH FILLET WELDS. SHOWS BENDING IN PLATES AND CONCENTRATION IN WELDS.

analysis of the structural member in question. The highly significant point to bear in mind is the fact that the stress distributions and concentrations illustrated, or any photo-elastic photograph, while taken from transparent plastic models, are representative of the actual stresses in a metal member. The optical analysis is much less laborious than the mathematical, and, with complicated structures, more nearly correct.

Civil engineers were the first to take cognisance of this new and useful tool of structural design. They were handicapped at the start by using models of glass.

There appears to be little that the architect can do to further this research. His contribution remains that of the interested spectator, appreciative at least of the æsthetic delights of imagining the fascinating kaleidoscopic changes of pattern which take place when someone dances on his pet structure.

One can imagine that in prefabrication schemes, where the architect acts as industrial designer in preparing streamlined models for mass-production, his task will merit a fastidious insistence on the preparation of transparent plastic models and a photo-elastic analysis of same to achieve the ultimate safe degree of economy in design.

REFERENCES.—"British Plastics and Moulded Products Trader," November, 1936. Mass. Institute of Technology, Photo-plastic Laboratory.

CORRESPONDENCE

(*Continued from page* 84.)

H L. Bullock, Mr. T. Pugh, Mr. I. J. Hayward.

(6) The Memorandum of Association of the Company makes suitable provision for the investment of funds, which are under the control of the board of management.

(7) Mr. Norman apparently calculates that a firm purchasing stamps for 120 men would "invest" the money twice over, and on that basis he refers to a "cash outlay" of twice the annual purchase of stamps which he suggests firms could utilise profitably in their own business. He may be assured that, although the purchase of the original stamps is inevitable, there will be no delays in advancing the money for payment of the benefits, and therefore no locking up of resources which might otherwise be used "in the business."

(8) He suggests it would be better "to take advantage of Government savings stamps rather than that the trade should lay out millions of pounds on stamps whose value appears to be ephemeral." There are several fallacies in his implications. Firstly, the money "laid out" by the trade is not on stamps but on holiday payments, and would be equally "laid out" if Government stamps were available, or if (as he himself seems to contemplate) a wage increase were given instead. Secondly, Government savings stamps would not meet the workers' aspirations for actual holidays or provide a system of distinguishing those who have earned a holiday and those who have not. Thirdly, holidays are in their very essence ephemeral, and, once the annual holiday is taken, it becomes a matter of looking forward to another year.

(9) Mr. Norman would "pay another halfpenny per hour, call it a holiday allowance and have done with it." If that would have met the situation various ½d. wage increases given in the past might be labelled as being in respect of several weeks of holiday per year. But would this "have done with it"? It is necessary to face the reality that organised workers are chary of arrangements which leave them to rely solely upon their own thrift, and that, without a definite scheme on the lines of the present one, there might be no general holiday, and therefore no satisfaction of the aspirations with which Mr. Norman himself expresses full agreement.

May I add in conclusion that careful consideration has been given over a number of years to the most effective type of holiday scheme for the building and civil engineering industries. Having regard to the constantly changing character of employment in these industries, the stamp-and-card scheme which has now been evolved was generally agreed to be the only satisfactory method of surmounting the difficulties of providing holidays in such a mobile industry.

E. J. CHAPMAN,
General Manager and Secretary,
Building and Civil Engineering Holidays Scheme Management, Ltd.
82, New Cavendish-street,
London, W.1.

TO THE EDITOR OF *The Builder*.

SIR,—With reference to Mr. Norman's letter, I note that he writes: "the Builders' Federation has informed my firm that *it is binding upon every registered building and civil engineering contractor to operate the scheme as from February 1 next.*"

As manager of a registered building firm I am concerned to know what right or authority the Builders' Federation have to impose their will on firms not affiliated to them.

The firm I represent does not belong to the Federation, but nevertheless the employees are guaranteed their annual holiday with pay; therefore our scheme is in operation, but not by the method laid down by the Building and Civil Engineering Holidays Scheme Management, Ltd., whom we know nothing about; neither, by the way, have we been informed by any Government Department that it is our duty to carry out the Builders' Federation scheme.

It would be interesting to know what the consequences would be to non-federated building firms who do not take up the scheme through the Management Company but who nevertheless are giving their employees holidays (or not).

A. E. HOADLEY.
Alverstoke, Gosport, Hants.

"The Average Builder."

TO THE EDITOR OF *The Builder*

SIR,—The details of the letter from Messrs. John Lay and Co. [*The Builder*, January 15] applies to every village, small town, urban district and city in England. There is no possibility under present conditions of obtaining work. The majority of the experienced builders in all districts are being forced out of business.

T. ABELL AND SONS.
Exmouth.

Removal of Derwent Bridge.

The work of removing the seventeenth-century bridge at Derwent, which is to be re-erected in its present outward appearance after the war as a memorial to the late Mr. John Derry, has now been completed, and the bridge is safely stored. Detailed drawings have been made and every stone is numbered.

R.I.B.A. EXAMINATIONS

THE FINAL.

THE Final Examination was held in London and Edinburgh from December 9 to 17, 1942. Of the 50 candidates examined, 28 passed as follows :—

Passed whole examination	15
Passed whole examination subject to approval of Thesis	4
Passed whole examination subject to approval of Thesis and remaining Testimonies of Study	1
Passed Part 1 only	7
Passed Part 2 only subject to approval of remaining Testimonies of Study...	1
	28

22 candidates were relegated.

The successful candidates are as follows :—

Bransgrove, Charles A.; Campbell, Rupert C. (subject to approval of Thesis); Carter, Gordon E.; Dobson, Roger; Douglas, James A.; Draper, Eric W.; Gauldie, W. Sinclair; Hooper, David V.; Jackson, Alec W.; Johnston, James S.; Leach, Alexander (subject to approval of Thesis and Testimonies of Study); Lightowlers, Cyril V. (subject to approval of Thesis); Lloyd, Sidney J.; Marriott, G. H. Gordon; Poel, Stanley B. (subject to approval of Thesis); Read, J. Winter; Roberts, Frank H.; Wagg, Donald (subject to approval of Thesis); Weinreich, Harald; Wood, Allan H.

Part 1 only.

Farquhar, Alexander; Forrest, Frank; Nightingale, George W.; Skelton, Norman T.; Taylor, Gordon F.; Trigg, Geoffrey H.; Tucker, Ernest F.

Part 2 only.

Adams, John T. (Distinction in Thesis). (Subject to approval of remaining Testimonies of Study).

THE SPECIAL FINAL.

This examination was held in London and Edinburgh from December 9 to 16.

Of the 28 candidates examined, 14 passed (4 of whom sat for and passed in Part 1 only) and 14 were relegated.

The successful candidates are as follows :—

Brittain, T. Arnold; Cooke, Leslie; Davies, Thomas L.; Easton, Frederic R.; Empsall, Raymond; Hogg, T. W. Dunkley; Hughes, W. Norman; Nunn, L. Watson; Price, Philip J.; White, Cyril G.

Part 1 only.

Booth, Raymond R.; Hammond, Horace G.; Pearce, A. Roger; Rosenberg, Eugene.

EXAMINATION IN PROFESSIONAL PRACTICE FOR STUDENTS OF SCHOOLS OF ARCHITECTURE RECOGNISED FOR EXEMPTION FROM THE R.I.B.A. FINAL.

The Examination was held in London and Edinburgh on December 15 and 17. Two candidates were examined and passed.

The successful candidates are as follows :—

Brierley, Edward, W.; Clifton, Philip E.

Concerts for Troops: L.M.B.A. Scheme.

Members of the London Master Builders' Association have, at the instance of the President, Mr. W. E. Rice, O.B.E., raised a fund to provide Sunday afternoon concerts for the troops on leave in London over the week-ends. The concerts will be organised by the Welfare Branch of London District, of which Col. Lord Nathan is Command Welfare Officer, and will take place in the Piccadilly Theatre. They are to begin next month. The National Sunday League is assisting.

PREFABRICATION

VIEWS OF REGISTERED HOUSE BUILDERS.

BRIEF reference to the possibilities of prefabrication in connection with house building was made in the summary of the report of the first annual general meeting of the National Association of Registered House Builders published in our last issue. We give below the full quotation from the report, which is now available.

It is probable, states the Report, that the conditions of future house building in this country "will be largely concerned with the need for speed in construction as the demand for our products will be very great indeed. In this connection we shall certainly hear a good deal more about dimensional standardisation and prefabrication, or rather pre-assembly of parts into large sectional units which can be speedily pieced together on the site. There is, of course, nothing revolutionary in this, although the coining of a new word, prefabrication, has brought protagonists and opponents into wordy warfare. A brick is a prefabricated unit with a thousand years of tradition behind it, and house-builders have long been accustomed to the pre-assembly of such parts as doors, windows and, where circumstances permit, sanitary fittings and plumbing. Extension of this principle to wall sections complete with services or to floor and ceiling units is not a big step provided that materials are forthcoming that are capable of accurate assembly on the site. In this connection it is well to remember that the assembly of mass-produced units is a precision job, whereas, because of the undulating nature of the average site, the varying weight-bearing capacities of different types of soil, the inconstant reaction of different materials to weathering and such other causes, a building must be elastic and does not lend itself to the same precise piecing together as do, for instance, the various component parts of a motor-car.

"In the United States, where timber is the material largely used for cottage building, templates and jigs assist the factory production of complete floor, wall and roof sections which are capable of being assembled into a house by the labour of six men in one day. Speed is thus achieved, but even its most optimistic well-wishers do not claim that this method results in any monetary economy. A study of American methods does not lead one to think that they could with advantage be generally copied in this country, partly because the bulk of our timber has to be imported, but more particularly because the United States do not build up to the high standards required by our building by-laws and our tradition.

"It would, however, be a mistake to think of pre-assembly simply in terms of timber. It should be remembered that in the munitions and aircraft industries considerable progress has been made with the development of new materials having qualities that may well recommend them for constructional and decorative purposes. These industries will not be content to retire from production when the demand for their war-time output ceases, and they are no doubt devoting considerable portions of their otherwise taxable profits to research into modifications of their products to fill peace-time uses. Just as houses having steel-plated walls found their way on to the market after the last war, so we may expect the incursion into the building industry of many materials and processes not hitherto associated with building. In this connection the plastic industry opens up a wide field of possibility, and some of the new metal alloys having great tensile strength in light sections may compete with the traditional carcassing materials, while the availability of cheap slag wool may solve the problems of heating and sound insulation that have hitherto limited the builder's choice of walling materials to brick and stone.

"An enlightened building industry, keeping an open mind in regard to these developments, will actively collaborate with other interests in expanding and hastening those that may bring improvement, expedition or economy, but will set its face resolutely against anything that would lower the present standards of construction. The industry, which has long been slandered, will not tolerate jerry-building, even if it appears under the cloak of progress."

PAYMENT BY RESULTS

NEW SCHEDULES.

THE Payment by Results Joint Advisory Panel has approved additional items to Schedules 5 and 19, which are issued as Addenda 1/1943 and 2/1943 to the Memorandum issued by H.M. Stationery Office on December 31, 1942. Addendum No. 1/1943 concerns Concrete Mixing and Placing (Central Mixing Plants), and Addendum No. 2/1943 adds basic and bonus rates referring to Seco hutting. Copies of these addenda as given below can be obtained from the Ministry of Works and Planning (A.S.64 Payment by Results), Lambeth Bridge House, S.E.1.

CONCRETE MIXING AND PLACING (CENTRAL MIXING PLANTS).

(Additional Items to Schedule 5.)

Operation.	Basis per hour.	Bonus.
Mixing by continuous type mixer similar to Regulus B.R. 25, with up to 5 men in gang.	15 cub. yds.	Per cub. yd. over basis, 4½d.
Placing concrete mixed by central mixing plant	2 cub. yds. per man ..	6d.

NOTES.

1. Work in placing to be equivalent to pouring a 6-in. slab with screeded finish; 2. Men engaged transporting concrete between mixer and place of deposit to receive same bonus as men in mixing gang; 3. Bonus to be equally divided.

HUTTING.

(Additional Items to Schedule 19.)

Name of hut.	Type.	Size.	Specification.	Scheduled production hours.	Bonus.
SECO ..	Standard ..	59 ft. 7 in. by 19 ft. 7 in.	Seco wall-units, window panels, roof panels, beams, columns, corner posts, eaves, roofspars, tie bars, keel-plates, baseboard, lintels, loose tongues, door frames, double blackout surround frames, metal windows, and sealing external joints.	100	1/100 of £5 11s. for each hour saved on scheduled production time.
				Basis.	Bonus.
Internal partitioning, black-out lobbies and other extensions to SECO standard huts, built up in SECO units.				2½ sup. yds. per man per hour.	5½d. per sup. yd. over basis.

THE UTHWATT REPORT

COMMENT BY SHEFFIELD AND S. YORKS SOCIETY.

THE Committee of the Sheffield and South Yorkshire Society of Architects and Surveyors, having carefully considered the Final Report of the Expert Committee on Compensation and Betterment (The Uthwatt Report), makes the following comments :—

(1) The Committee fully approves the proposal to institute a central or national planning authority. It suggests that the objects of national planning can be adequately met by substituting for the present planning legislation a new and concise Act setting up a central planning authority to control all the land in the country whether developed or undeveloped. This control should be complete and operative, for, unless the central authority has such control, antagonism between authorities, with consequent delay and obstruction, will continue as at present and be intensified. The Committee prefers such control to the revolutionary alterations in the laws of property recommended in the Report.

(2) The Committee views with misgiving the revolutionary alterations in the laws of property suggested in the Report. Security of property is the solid foundation upon which credit stands. The Uthwatt Committee's proposals strike at this security. They will certainly shake credit severely and may even cause its collapse.

(3) If the proposals in the Report are put into force the Committee is strongly of the opinion that land should be bought at its *free market value* at the time of purchase and be subject to the same conditions as are provided in the Acquisition of Lands (Assessment of Compensation) Act of 1919.

4. The Committee are fully in accord with the reservations of Mr. James Barr on the scheme for periodic levy on increase in annual site value—as stated in (11) pages 169 to 170 of the Report.

Building Material Producers.

The executive committee of the National Council of Building Material Producers held its first meeting on January 8 and, on the motion of Sir P. Malcolm Stewart, the President, unanimously elected Mr. H. J. C. Johnston, Hon. A.R.I.B.A., as Chairman of the Committee. Mr. Johnston is a past president of the National Federation of Clay Industries, as also of the Building Industries National Council, on which body he has throughout served as chairman of the Materials Group.

It is learnt that, since the date of the inaugural meeting of the National Council of Building Material Producers on October 1 last, seven further important associations, not present at that meeting, have applied for membership and that many others have established contact for the purpose of inquiry and information.

THE NATIONAL FEDERATION

65TH ANNUAL REPORT.

THE 65th annual report of the National Federation of Building Trades Employers, to be presented at the annual meeting on January 27, at Friends' Meeting House, contains much of interest to the building industry. The general building situation after three years of war is outlined, and the present position is thus summed up: "As from the virtual end of the war programme, the industry is of interest to the Government chiefly as the potential means of absorbing labour after the war, and various types of Government 'planning' are in prospect, having the avowed object of fitting the industry for its post-war functions." Reference is made to Government intervention in the direction of virtually nationalising the industry for many purposes of post-war reconstruction, and the Report adds: "(i) that the tendencies have sometimes been much more dangerous in the original Government proposals before they were notified after discussions with the industry; (ii) that the danger is not past and does indeed lurk in various Government discussions now proceeding and involving increased Government direction and controls; (iii) that your representatives have regarded the countering of this danger as their paramount duty because the whole future of our members, whether large or small, is in the balance."

Reference is made to the agreement for Holidays with Pay in the building and civil engineering industries, which comes into operation as from February 1 next. Also the complex question of apprenticeship and indentures, hitherto dealt with on a regional or local basis, has advanced a further stage by the establishment of a National Apprenticeship Scheme agreed between the Employers' and Operatives' Federations. The year has also seen the establishment of a Staff Pension Fund, which has been welcomed by a number of Federation members.

Forms of Contract.

A difficult situation was created in August last by the introduction by the Government of a new Standard Form of Contract for use in building and civil engineering work. "After the Federation had instructed members to qualify their tenders, discussions with the Government's Contracts Co-ordinating Committee resulted in the making of an agreement which enabled the Federation Council to remove the instruction to qualify tenders on this form. At the same time a definite assurance was received that the Government will negotiate with the Federation an agreed Form of Contract for building works for use in the post-war period."

The Federation has also had under consideration a Form of Contract (N/VAS/C—Edition 1) intended for use in the event of invasion. The Government's proposals as to conditions under which works would be carried on were unacceptable to the Federation, and while there can be no question that all works required for the war effort would be carried out promptly as directed, the Federation adheres to the advice already given to members against acceptance of the conditions laid down in the contract.

Other points from the Report are :—

MAN-POWER.—An interesting section is devoted to this subject, and reference made to the Ministry of Labour Leaflet No. N.S. 259, which has been issued to all registered employers.* The meeting at the Central Hall on June 9 is referred to, when the Minister of Labour, after making clear that a considerable dislocation of the normal life of the industry would be necessary in order to carry out the special programme of U.S. camp building in the time required, stated his willingness to arrange that, where employers agreed that a number of their men should be transferred, the Ministry would endeavour to transfer them as a team and to return them afterwards to their previous employer. "Notwithstanding his expressed intention, it was found in practice that the arrangements for compulsory transference were often carried out with some ruthlessness." On the question of equal treatment for men employed by private firms and by local authorities or public utility undertakings, the Federation has pressed that there should be no discrimination in favour of local authorities or public utility undertakings, and representations have been made to the Government in respect of certain instances.

ALLOCATION OF CONTRACTS.—The Allocation of Contracts Sub-committee has been at work in devising the principles upon which contracts in the special programme should be let, and has aimed at a greater spreading of work among the largest possible number of firms. Among the measures taken were : (1) Splitting up projects into several contracts, (2) prevention of overloading by using a Central Register of firms employing over 100 men and placing work on the principle that when the work in hand of a contractor has reached 60 per cent. of his average war-time turnover he has been automatically excluded from invitations to tender until his uncompleted work in hand falls to 40 per cent. of that average turnover. It was agreed that a firm not barred from tendering by the above arrangements (*i.e.*, being below the 60 per cent. level) should nevertheless not be considered as eligible for any single contract which would increase its load to more than 125 per cent. of its annual average turnover; and (3) general widening of tenders lists. At the inception of the scheme in June last the number of firms on the Central Register (as employing over 100 men) was 1,257, subsequently reduced to 899, some of which were specialist in character. In June, the number of these firms which had received invitations to tender for Government contracts was 645, and by the end of November this figure had become 734.

On compulsory sub-contracting, the Building Directorate policy of requiring their main contractors to sublet work up to 20 per cent. of every contract of more than £60,000 value, had not met with success, according to the Government, because in many instances neither the contractor nor the Ministry's Works and Buildings Organisation had been able to obtain the assistance of sub-contractors willing and able to carry out portions of the works, even if some latitude was allowed in the matter of price. The Ministry further reported numerous cases where firms whose names were submitted had refrainied from tendring.

As regards grouping of contracting firms, the Report states that of 30 groups in the Central Register at the end of November, 10 had tendered for substantial contracts and 5 groups had secured such contracts. The Ministry reports that these tenders had been well within the general level of prices quoted by successful contractors.

LABOUR SUPPLY AND WELFARE.—One unusual development has resulted from the earlier action of the Government in unbalancing the industry by calling up a disproportionate number of labourers, namely, the compulsory transfer of craftsmen to work as labourers on priority jobs. Such men were described as "designated craftsmen," and the Government decided that they should continue to receive the craftsmen's rates of wages. The difference between the two rates is reimbursed to contractors, but representations have been made for further consideration of the extra cost on the ground that such men are often not capable of producing even the war-time labourer's output.

ADVISORY COUNCIL.—The Advisory Council of the Building and Civil Engineering Industries—set up in September by Lord Portal under the chairmanship of Mr. G. H. Parker, C.B.E.—has been asked to consider proposals for the pooling in certain chosen localities of the resources of local firms employing not more than 25 men for the purpose of carrying out smaller and local types of work, such as house restoration as well as essential maintenance. The labour allocated here would be that of "immobile" men (generally aged 51 and over), and there would be appropriate arrangements for sharing overheads and profits. The scheme is intended to be operated by the Regional Works and Buildings Organisations, which are understood to be making arrangements accordingly in some localities.

TRADE UNION SITE REPRESENTATIVES.—To secure smooth running of important jobs by early ascertainment of possible sources of labour difficulties and complaints, T.U. site representatives have been appointed to a number of large and important sites or groups of sites. Discussions are now in progress with regard to financial considerations and the proposed appointment of trustees. Reports received from contractors are, generally speaking, favourable, but it is evident that much depends upon the personality the site representative.

Negotiations with the War Damage Commission and relations with the Operatives receive attention in the Report. As regards the latter, reference is made to the Operatives' request for an immediate all-round increase of 3d. per hour and the establishment of the labourer's rate at 80 per cent. of the corresponding craftsman's rate. The Operatives have intimated that they cannot contemplate postponement until the end of the war, and later submitted formal notices to the National Joint Council for the amendment of the National Joint Agreement to give effect to the proposals. Meanwhile, discussions have continued informally without so far disclosing a basis for agreement.

REGISTRATION OF BUILDERS.—A Committee has been appointed to consider the matter of the registration of builders on a qualitative basis. The terms of reference are to explore the possibilities of a scheme for the compulsory and statutory registration of builders.

The Report pays a special tribute to the President, Mr. T. Howarth, O.B.E., for the manner in which he has devoted himself to the duties of his office.

A Kent Presentation.

A presentation to mark "35 years of continuous loyal and devoted service to the Kent Education Committee and Kent County Council" was made on January 2 to Mr. Frank Cremer, L.R.I.B.A. Mr. S. H. Loweth, Acting County Architect, made the presentation.

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*A list of occupations in which the call-up is being suspended temporarily has been issued and is given on page 96.

THE MINISTRY OF WORKS

ITS FUNCTIONS AND CONTROLS.

SPEAKING to the Woolwich Rotary Club on Monday, January 11, MR. GEORGE HICKS, M.P. (Joint Parliamentary Secretary to the M.O.W.P.) said that all had seen the announcement that a new Ministry of Town and Country Planning was to be formed which would take away from the Ministry of Works the planning functions with which it was entrusted in July last year. He felt that, as we had now come to the end of another stage in its history, it might be of interest to hear something of the Works side of the Ministry which had come particularly within his cognisance.

"One of the main problems with which we have to grapple is the general supervision of the Building and Civil Engineering Contracting Industries with particular reference to the capacity for production, and we are responsible for securing that the industries are so organised as to be able to deal in the most efficient and economical manner with the Government programme of war and post-war building. Moreover, in conjunction with the Ministry of Labour and National Service, it is our task to see that the man-power of these industries is used to the best advantage. We maintain the closest co-operation with all the Departments concerned and with the Federations and Unions of the employers and employees with regard to these matters.

"The Minister has appointed an Advisory Council to help him, consisting of persons nominated by the industrial and professional bodies attached to the industry, who have special knowledge of industrial and professional matters pertaining to the industries. This council, which was set up by Lord Portal when he came to the Ministry, advises on major proposals involving questions of principle or policy. There are also committees consisting of Ministers and their representatives to co-ordinate the policy and procedure of Departments and to advise on measures of control in the industry, together with the administration of the allocation of labour and the control of materials between Departments in carrying out the Government building programme. These committees can call for the advice of the Building Programme Joint Committee which numbers among its members representatives from both employers' and employees' organisations.

"One of the most important measures which has been taken since the formation of the Ministry is the application of the Essential Work Order to the Building and Civil Engineering Industries. The necessary Order was made by the Minister of Labour, after close consultation with my Ministry, on January 9, 1941. The Order provides for the payment of a guaranteed wage to all specified persons employed on scheduled sites. Moreover, workmen on such scheduled sites cannot leave or be dismissed without the consent of the National Service Officer of the Ministry of Labour. Over 5,000 sites have been scheduled under the Order. The Order also introduces a new principle governing employment in the building industry. One of the conditions of scheduling is that a system of 'payment by results' must be introduced wherever practicable and desirable. Payment by results had been recognised in civil engineering contracting agreements in the past, but there had been no corresponding agreements in the building industry. We have also applied the Essential Work (General Provisions) Order to the various building materials industries to maintain the labour forces there and to secure the supply of essentials, such as bricks, cement and roofing materials. We are also responsible for the control of Contractors' Plant, and a Directorate has been set up to deal with this, to ensure that the best possible use is made of all the available sources of construction machinery within this country. Maximum rates for the hire of plant have also been fixed.

Control of Private Building.

"A Defence Regulation has also been made which prohibits building operations costing more than £100 without authority or licence. Very large quantities of material have been conserved because of this provision, not to mention the corresponding saving in labour. From the beginning of the Control in October, 1940, nearly 200,000 applications for licences have been received and dealt with. Of these over 140,000 were in respect of works of construction, reconstruction, or alteration and the remainder in respect of maintenance work.

"Of the 140,000 applications for building operations, one-third have had to be refused because they were regarded as unessential for the prosecution of the war or the upkeep of civil morale. Work to the value of approximately £52 million has been allowed to proceed, consisting mainly of the construction, reconstruction or extension of war factories, the repair of war-damaged factories or houses and the work connected with agriculture. Work to the value of approximately £24 million has not been permitted to start. Even where licences have been granted it has been possible to secure a saving of 25 per cent. in the steel originally asked for, 30 per cent. in cast iron and 25 per cent. in timber by requiring the use of alternative materials. My Ministry has also taken very considerable pains to ensure that adequate supplies of cement, bricks, window glass, plasterboard, ballast, sand, gravel, asbestos cement sheets and other essential building materials shall be available. In close touch with the Ministry of War Transport we are doing everything possible to reduce haulage of these supplies to a minimum. Generally speaking, regulation of supplies is undertaken in close contact with the manufacturing groups concerned so that materials are available on sites as and when required for all purposes in connection with the war effort.

"In December, 1940, a Committee on Building Material Standardisation was appointed and a very considerable amount of most useful work has been done. Before the committee commenced operations, for instance, there were over 400 types of doors. They have now been reduced to three types, which are manufactured in seven sizes. Moreover, the 17 kinds of bricks which were in common use throughout the country have been reduced to two. There are now only 30 types of metal windows instead of the pre-war figure of 300. Most useful work in connection with economy of painting and decoration work has also been undertaken and there has been a considerable reduction in peace-time standards in electric wiring, heating and hot-water installations.

Supply of Equipment.

"There is another important side of my Ministry's activities which does not often get much publicity. The Supplies Division is responsible not only for the furnishing of all Government offices, but also for the purchase, storage and supply of stores in great variety. The annual value of these purchases at the present time is, in round figures, £25,000,000, and they cover furniture, fittings, canteen equipment, ironmongery, chandlery, and a great number of other supplies for factories, hostels, hutments, barracks and camps. The figures per annum which I now quote will indicate the extent of this service: Crockery, 25,000,000 pieces; soap, 25,000,000 tablets; chairs, 1,750,000; black-out material, 7,000,000 yards; fire-hose, 3,500 miles; fuel—coal and coke, 650,000 tons. In addition, since 1938 10,000,000 sleeping-places in beds or bunks have been provided.

"In addition, all the equipment for the National Fire Service (pumps, ladders, fire engines) has been supplied through the machinery of this Division, and stirrup-pumps are also bought in numbers which, over the last few years, have run into several millions. The care of ancient monuments and historic buildings has been practically put into cold storage for the duration, but we are able to advise on the treatment of buildings of architectural and historic importance which have been damaged by the enemy. I have, even now, not touched on all aspects of my Department's work, but, further, we have undertaken on behalf of the Ministry of Fuel and Power the winning of outcrop coal, and hope from this source to supplement very materially the nation's coal supply during the coming months."

OBITUARY

William Hunt, J.P., F.R.I.B.A.

We have to record the death, on January 13, of Mr. William Hunt, J.P., F.R.I.B.A., aged 88. Articled to his father, Charles Hunt, William carried on the practice in conjunction with his son Edward, and carried out a large amount of work, among his buildings being Wandsworth Civic Centre and Brettenham House, Wellington-street, Strand. Other works were: Tooting Public Library; the Blind Institute; publishing offices in Essex-street for the *Illustrated London News;* a large number of public halls, offices and flats, many of them for the Law Land Building Department. Other appointments the firm held were as architects for the Fulham and Hampstead Property Co. and the City General Trust. Mr. Hunt had been a member of the London County Council and was a Justice of the Peace for the County of Middlesex.

Andrew Hamilton, F.R.I.B.A.

The death has occurred at Glasgow of Mr. Andrew Hamilton, F.R.I.B.A., who retired in 1941 from the firm of Messrs. Cook and Hamilton, architects, Paisley. The Palace Picture Theatre and the New Templar Hall, Paisley, were among his buildings.

BUILDING AND CIVIL ENGINEERING CALL-UP

It is essential for the successful prosecution of the war that additional men be withdrawn from civilian life for the Services, and for this purpose it has been decided by the Ministries of Labour and Works that a further call-up of men will be made from the Building and Civil Engineering industries, beginning this month.

The Government appreciates that this will cause considerable difficulty to employers and to firms and members of the public for whom the industries work, but is confident that whatever difficulties may be caused will be accepted willingly in the national interest.

In order to reduce the burden upon the industries as much as possible, the following arrangements have been made :—

(i) Occupations in which the Call-up is being Suspended Temporarily (see List A).

In certain classes of occupation it has been arranged to postpone the call-up of men aged 25 and over at the time they registered until after the end of March, 1943. The occupations to which this decision applies are :—

List A.—(i) (Occupations in which men aged 25 and over at registration will be exempted from call-up).

Bricklayer's Labourer; Builder's Labourer; Mason's Labourer; Slater's or Roof Tiler's Labourer; Plasterer's Labourer; Mixer; Foreman, Charge Hand (Roofing Felt Fixer or Layer); Red Leader (not Ship Painter's Labourer); Plumber's Labourer, Plumber's Mate; Lead Burner's Helper; Gas Fitter's, Pipe Fitter's, Water Fitter's Mate.

Concreter, Leveller or Screeder, Ferro-concreter; Rigger; Scaffolder (tubular or patent); Scaffolder (wood), Staging Hand; Steel Bender and Fixer, Iron Worker (ferro-concrete); all occupations in this paragraph include Foremen and Charge Hands.

General Foreman (civil engineering); Ganger, Stationary Ganger, Travelling Ganger (navvy); General Navvy; Cement Gun Operator; Pile Driver; Service Layer, Pipe Layer and Jointer (gas and water mains); Sewer Pipe Layer and Jointer; Timberman (public works, including sewer, bridge or dock); Tunnel Miner, Tunneller, Heading Driver; Concrete Runner or Worker; Timberman's Mate; Tunnel Miner's Labourer; Sheeter, Iron Roofer; Constructional Iron and Steel Erector's Labourer or Mate; General Labourer (heavy work); General Labourer (light work).

(ii) (Occupations in which men under 30 at registration will *not* be exempted from the call-up.)

General Foreman (building trades); Foreman Charge-Hand Plumber, Gas and Hot Water Fitter, etc.; Plumber (general hand); Hot Water, Heating and Domestic Engineer, Pipe Fitter; Pneumatic or other Mechanical Tool Operator.

(iii) (Occupations in which men below the age of 25 at registration will be exempted from the call-up.)

Foreman, Outside Erector (constructional iron and steel fitter and erector); Constructional Iron and Steel Fitter and Erector (general hand).

For the present, therefore, there is no need to apply for deferment of men in the above occupations.

(2) Other Occupations marked "SS" in the Schedule of Reserved Occupations (Revision, December, 1941). (See List B.)

The great bulk of the men (other than those in the occupations given in List A above) who are liable for military service will be recruited for the Forces, and it will, in general, be useless for employers to put in applications for deferment in these cases, since such applications cannot be granted. There may, however, be certain cases in which individual deferment may be granted in the interests of public health or in respect of certain types of job which only young men can do. Applications may also be considered in exceptional cases in respect of working principals or foremen engaged on urgent Government or other priority contracts. Applications for deferment will therefore be considered for the men in these categories :—

List B.—Working Principals or Foremen (not included in List A) engaged on urgent Government or other priority contracts; Slaters and Tilers; House Breakers, Top Men, Mattock Men; Men working at heights; Men engaged by contractors in maintenance work on railways and public utilities; maintenance of farm buildings; recovery of outcrop coal.

(Application for deferment will not be considered in other cases unless there are most exceptional reasons.)

Applications for such men should be made in the normal way on Form N.S.300. Any deferments granted will be for short periods only.

The call-up will be made, so far as possible, in order of age, beginning with the youngest age groups, but it will ultimately cover all men who were below the age of 41 at the date when their age group was required to register. Applications for deferment of any men in the categories in List B whom it is desired to retain temporarily should have reached or reach the Local Office of the Ministry of Labour and National Service shown in the man's National Service Registration Card (N.S.2) before the dates given below :—

December 21, 1942.—For men aged 32 or 33 on registration (*i.e.*, born between July 28, 1906, and July 13, 1908).

January 7, 1943.—For men aged 34, 35, 36 on registration (*i.e.*, born between January 19, 1904, and July 27, 1906).

February 7, 1943.—For men aged 37, 38, 39 on registration (*i.e.*, born between June 1, 1901 and January 18, 1904).

March 7, 1943.—For men aged 40 on registration (*i.e.*, born between July 1, 1900, and May 31, 1901).

Men affected by the arrangements will be summoned for medical examination without delay and in some cases before the final date for submitting applications for deferment. Summons to medical examination, however, will not affect consideration of such applications. The arrangements mentioned in this article are not retrospective, and enlistment notices already issued will not be withdrawn.

(3) Other Occupations in the Building and Civil Engineering Industries (see List C).

As regards men in the Building and Civil Engineering Industries, *not* in occupations marked "SS" in the Schedule of Reserved Occupations (Revision, December, 1941), deferment may be granted in suitable cases until the end of March, 1943. In the occupations set out below, deferment will be granted in all cases of men employed on Super-Preference and W.B.A. contracts :—

List C.—(i) (Occupations in which men aged 25 or over at registration who are employed on Super-Preference and W.B.A. contracts will be granted deferment) :—

Asphalter (spreader or raker); Burners and Cutters; Agents and sub-agents (building and civil engineering contracting); Travellers, Assistant Travellers (civil engineering contracting); Cost Clerks, Bonus Clerks, Electricians' Mates.

(ii) (Occupations in which application for deferment may be considered for men below the age of 25 at registration) :—

Fitters, Mechanics, and Maintenance Engineers engaged on the repair and maintenance of contractors' plant; Drivers of contractors' plant, *e.g.*, Mechanical Navvy Driver; Electricians; Wiremen; Cable Jointer, Repairer (high-tension cables); Cable Jointer (excluding high-tension, but including telephone and telegraph cables).

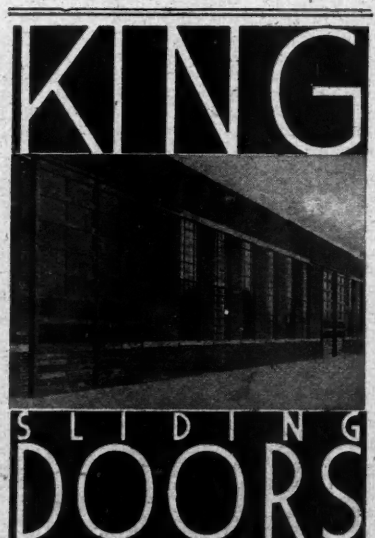
(iii) Progress Clerks will not be granted deferment if below the age of 30 at registration.

In other cases applications will be considered on their individual merits. No applications for the deferment of such men need be made for the time being, if current deferments are in operation, but when a period of deferment is coming to an end a renewal application should be made in the usual way on Form N.S.300 at least three weeks before the date on which the current period expires, to the Local Office of the Ministry of Labour and National Service shown on the man's National Service Registration Card (N.S.2).

(4) Men Directly Employed by Local Authorities or Public Utility Undertakings.

Men in building and civil engineering occupations directly employed by local authorities or public utility undertakings, if engaged on such work as is generally undertaken by builders or public works contractors (*e.g.*, on construction of new roads, or other works of construction, such as new sewers, large-scale repair (not being ordinary routine maintenance) or roads, building and maintenance of houses) are regarded as being employed in the building and civil engineering industries, and the arrangements set out here apply.

Men in building and civil engineering occupations otherwise employed by local authorities and public utility undertakings (*e.g.*, on ordinary maintenance of public utilities) are not regarded as being in the



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building and civil engineering industries, and these arrangements do not apply. The usual arrangements regarding deferment apply, however.

It is essential that all questions on the form N.S.300 should be answered irrespective of the number of men employed and any instructions to the contrary on the form should be ignored. The site on which the man is working and the contract number should be clearly specified in the space for answer to Question 15 on the form.

ASSOCIATION OF BUILDING TECHNICIANS

COURSE IN BUILDING CONSTRUCTION.

THE Association of Building Technicians (formerly the A.A.S.T.A.) which has affiliated to the National Federation of Building Trades Operatives, has arranged a course in building construction with the Education Department of the London County Council. The objects of the course are to teach tracers and others, already having experience in draughtsmanship, the elements of building construction. Lectures will deal with all the essential elements of a building and visits to jobs will be arranged. Particulars are as follows: Place—The Polytechnic, 309, Regent-street, London, W.1; time—Thursday and Friday evenings from 6 to 9; if students prefer, the course can start at 6.30; dates—starting January 21 and continuing until April; cost—approximately £1. Applications should be sent to the Head of the School of Architecture, the Polytechnic.

COMMERCIAL REFRIGERATION

EXTENSION OF C.E.R.A.'s OBJECTS.

ARISING out of a request by the Government that the Commercial Electric Refrigeration Association (C.E.R.A.) should endeavour to rationalise servicing conditions, with a view to economy in petrol and tyres, the whole scope of the Association, first founded in 1940, has been widened, and applications are to be invited from all properly engaged in the business of commercial refrigeration, including gas-operated plant, to ensure that the Association shall be fully representative of the industry. A council—composed of representatives of the machinery manufacturers, insulation contractors and distributors and servicers—has been set up under the chairmanship of Mr. E. G. Batt (G.E.C./Coldair, Ltd.), with Mr. Felix A. Rogers, 36, Kingsway, W.C.2, as Secretary.

The aims of the Association, as explained at a luncheon held in London last week, include the promotion and protection of the industry, having due regard to the interests of the public and regulation of relations between members.

A Retirement.

Messrs. Fredk. Braby and Co., Ltd., announce that Mr. T. Pearson, the manager of Fitzroy Works, retired from business on December 31, after 49 years of service with this company. During this period he was for many years in charge of the Outworks Department, and was responsible for copper roofing contracts, which brought him into contact with many architects. Mr. Pearson has received several handsome gifts on his retirement from the directors, staff and workmen, by whom he was very highly esteemed.

CONTRACTS OPEN

For some contracts still open, but not included in this list, see previous issues. Those with an asterisk are advertised in this number. The dates at the head of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING.

JANUARY 25.

Leeds T.C.—Maintenance repairs to properties (various trades). R. A. H. Livett (A.), Housing Director, Priestley House, Quarry Hill, Leeds, 9. Dep. 5s. per trade (not returnable).

JANUARY 26.

Manchester T.C. — Extensions to day nursery at St. Aidan's Rectory, Bosworth-st., Openshaw. City Architect. Dep. £1 1s.

JANUARY 27.

Merton and Morden U.D.C.—Maintenance repairs and redecoration of 535 houses. S., Morden Hall, S.W.19.

JANUARY 28.

Cheshire C.C.—Conversion of existing premises for special clinic at Crewe. E. M. Parkes, County Architect, The Castle, Chester. Dep. £1 1s.

JANUARY 29.

Loughborough T.C.—Demolition of 14 houses. H. Bintcliffe, Sanitary Inspector's office.

JANUARY 30.

Bromley T.C.—Strengthening of part of shelter at Girls' County school. B.E.

Camborne-Redruth U.D.C.—Repairs to houses. G. P. Paige, C., 3, West End, Redruth.

FEBRUARY 1.

Ballymoney U.D.C. (a) Reconstruct and strengthen 5 existing public shelters; or (b) to demolish above shelters and erect others to replace them. R. Robinson, Town S.

Feltham U.D.C.—Construction of static water tank. E. and S.

Lisburn U.D.C.—Extension to existing control centre. Town S.

FEBRUARY 2.

Manchester T.C.—Erection of prefabricated hutment and adaptation as nursery at Sloane st., Bradford. City Architect. Dep. £1 1s.

FEBRUARY 6.

Eccles T.C.—Erection of "Nashcrete" prefabricated building at Winton for British Restaurant. B.E. and S.

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FEBRUARY 8.

Twickenham T.C.—Erection of day nursery at Hampton. B.E. Dep. £1 1s.

FEBRUARY 13.

Rainford U.D.C.—Erection of Nashcrete prefabricated building, together with foundations, drainage, etc. R. C. Haycock, S., Dep. £1 1s.

NO DATE.

Cheltenham T.C.—Strengthening of 47 communal shelters. B.E.

MATERIALS, &c.

JANUARY 25.

Bridlington T.C.—Road materials. B. E. and S.

Merioneth C.C. — Road materials. County S., Dolgelley, Merioneth.

JANUARY 26.

Bradford T.C.—Road materials, etc. City E.

JANUARY 27.

Wood Green B.C.—Road materials. B. E. and S.

JANUARY 29.

Lambeth B.C.—Road materials, etc. G. H. Buckett, M. Inst. M.&Cy.E.

Stourbridge B.C.—Road materials, etc. B.E. and S.

JANUARY 30.

Belper U.D.C.—Road materials. S.

Bootle C.B.—Road materials, etc. B.E. and S.

FEBRUARY 1.

Rhondda U.D.C.—Road materials. E. and S.

FEBRUARY 3.

East Riding C.C.—Road materials. County S., County Hall, Beverley.

Southwark B.C.—Road materials, etc.

FEBRUARY 4.

Kensington B.C.—Road materials, etc. T.C.

Swansea C.B.—Road materials, etc. B. E. and S.

FEBRUARY 5.

Todmorden B.C. Road materials. B.E.

FEBRUARY 6.

Halifax T.C.—Road materials, etc. B.E.

Swadlincote U.D.C.—Road materials, etc. E. and S.

FEBRUARY 8.

Carmarthenshire C.C.—Road materials, etc. County S., Wellfield-rd., Carmarthen.

Cornwall C.C.—Road materials, etc. County S., County Hall, Truro.

Enfield U.D.C.—Road materials, etc. E. and S.

FEBRUARY 10.

Runcorn U.D.C.—Road materials, etc. E. and S.

FEBRUARY 12.

Rainford U.D.C.—Road materials. S.

Tottenham B.C. — Road materials. T.C.

FEBRUARY 13.

Bromley T.C.—Road materials, etc. B.E.

FEBRUARY 20.

Caernarvonshire C.C.—Road materials, etc. County S.

Settle R.D.C.—Road materials, etc. S.

Wolverhampton C.B.—Road materials, etc. B.E.

PUBLIC APPOINTMENTS.

JANUARY 28.

Southampton E.C. — Full-time teacher of either Carpentry, Bricklaying or Plumbing. F. L. Freeman, Secretary, Education Office.

JANUARY 30.

Herefordshire C.C.—Temporary Architectural Assistant. Executive Officer, Architectural Dept., County Offices, Hereford.

FEBRUARY 3.

Grimsby E.C.—Teacher of Building Subjects, Junior Technical School. Application form from Education Offices, Eleanor-st., Grimsby.

FEBRUARY 5.

Bournemouth C.B.—Full-time Lecturer in general Building Subjects. Director of Education, Town Hall.

RATES OF WAGES IN THE BUILDING TRADE

AS AND FROM 1st FEBRUARY, 1942

[Every endeavour is made to ensure accuracy, but we cannot be responsible for errors]

	Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.		Crafts-men.	Lab-ourers.
Aberavon	1/11	1/6½	Clitheroe	1/11	1/6½	Isle of Thanet	1/9	1 4½	Saxmundham	1/7½	1/3½
Aberdare	1/11	1/6½	Cobham (Surrey)	1/10	1/5½	Isle of Wight	1/8½	1/4½	Scarborough	1/10½	1/5½
Abergavenny	1/11	1/6½	Colchester	1/10½	1/5½	Keighley	1/11	1/6½	Scunthorpe	1/11	1/6½
Abingdon	1/9½	1/5	Colwyn Bay	1/10	1/5½	Kenilworth	1/11	1/6½	Selby	1/11	1/6½
Accrington	1/11	1/6½	Congleton	1/10½	1/5½	Kettering	1/11	1/6½	Sevenoaks	1/9½	1/5
Aldeburgh	1/7½	1/3½	Coventry	1/11	1/6½	Kidderminster	1/10½	1/5½	Sheerness	1/9	1/4½
Aldershot	1/9½	1/5	Cranbrook	1/9	1/4½	King's Lynn	1/9	1/4½	Sheffield	1/11	1/6½
Alfreton	1/11	1/6½	Cranleigh	1/9	1/4½	Kirkham	1/11	1/6½	Shipley	1/11	1/6½
Alnwick	1/10½	1/5½	Crawley	1/9	1/4½	Knowle	1/10½	1/5½	Shoeburyness	1/10½	1/5½
Altrincham	1/11	1/6½	Crewe	1/10½	1/5½	Lancaster	1/11	1/6½	Shoreham	1/10	1/5½
Amble	1/10½	1/5½	Cromer	1/8	1/4	Leamington	1/11	1/6½	Shrewsbury	1/10½	1/5½
Amersham	1/9½	1/5	Crowborough	1/9	1/4½	Leatherhead	1/10	1/5½	Sittingbourne	1/9	1/4½
Ammanford	1/11	1/6½	Cuckfield	1/9	1/4½	Leeds	1/11	1/6½	Skegness	1/10	1/5½
Andover	1/9	1/4½	Darlington	1/11	1/6½	Leicester	1/11	1/6½	Sleaford	1/9½	1/5
Ardingly	1/9	1/4½	Darwen	1/11	1/6½	Leighton Buzzard	1/8	1/4	Slough	1/10	1/5½
Arundel	1/9	1/4½	Daventry	1/9½	1/5	Letchworth	1/10	1/5½	Southampton	1/10½	1/5½
Ascot	1/9	1/4½	Deal	1/9	1/4½	Lewes	1/9	1/4½	Southend-on-Sea	1/10½	1/5½
Ashby-de-la-Zouch	1/11	1/6½	Denbigh	1/10	1/5½	Lichfield	1/10	1/5½	Southport	1/11	1/6½
Ashford (Kent)	1/9	1/4½	Derby	1/11	1/6½	Lincoln	1/11	1/6½	South Shields	1/11	1/6½
Ashford (Middlesex)	1/11	1/6½	Devizes	1/8	1/4	Littlehampton	1/9	1/4½	Spalding	1/9	1/4½
Ashington	1/10½	1/5½	Dewsbury	1/11	1/6½	Liverpool	‡§2/1	¶	Stafford	1/10½	1/5½
Ashtead	1/11	1/6½	Didcot	1/9	1/4½	Llandudno	1/10	1/5½	Staines	1/10	1/5½
Ashton-under-Lyne	1/9	1/6½	Diss	1/7½	1/3½	Llanelly	1/11	1/6½	Stamford	1/10	1/5½
Aylesbury	1/8	1/4½	Doncaster	1/11	1/6½	London—			Stevenage	1/10	1/5½
Aylsham		1/4	Dorchester	1/8½	1/4½	12m. radius	*2/0½	1/7½	Stockport	1/11	1/6½
Bagshot	1/9	1/4½	Dorking	1/9½	1/5	12-15m. radius	*2/0	1/7	Stockton-on-Tees	1/11	1/6½
Banbury	1/9	1/4½	Dover	1/9	1/4½	Long Eaton	1/11	1/6½	Stoke-on-Trent	1/11	1/6½
Barnsley	1/11	1/6½	Dovercourt	1/9	1/4½	Longton	1/11	1/6½	Stourbridge	1/11	1/6½
Barnstaple	1/9	1/4½	Driffield	1/9½	1/5	Loughborough	1/11	1/6½	Stourport	1/10½	1/5½
Barrow-in-Furness	1/11	1/6½	Droitwich	1/10½	1/5½	Louth	1/9½	1/5	Stowmarket	1/8	1/4
Barry	1/11	1/6½	Dudley	1/11	1/6½	Lowestoft	1/9	1/4½	Stratford-on-Avon	1/10	1/5½
Basingstoke	1/9	1/4½	Dunstable	1/9½	1/5	Luton	1/10½	1/5½	Stroud	1/10	1/5½
Bath	1/10½	1/5½	Durham City	1/11	1/6½	Macclesfield	1/10½	1/5½	Sunderland	1/11	1/6½
Batley	1/11	1/6½	Eastbourne	1/10	1/5½	Maidenhead	1/10	1/5½	Sutton Coldfield	1/11	1/6½
Beaconsfield	1/9½	1/5	E. Glam. (Mon. Val.)	1/11	1/6½	Maidstone	1/9½	1/5	Swaffham	1/7½	1/3½
Beccles	1/7½	1/3½	East Grinstead	1/9	1/4½	Malvern	1/9½	1/5	Swanage	1/9	1/4½
Bedford	1/10½	1/5½	Edenbridge	1/9	1/4½	Manchester	1/11	1/6½	Swansea	1/11	1/6½
Berkhamsted	1/9	1/4½	Ely	1/8	1/4	Manningtree	1/8	1/4	Swindon	1/9½	1/5
Berwick	1/10½	1/5½	Epping	1/11	1/6½	Mansfield	1/11	1/6½	Tamworth	1/10½	1/5½
Beverley	1/11	1/6½	Exeter	1/10½	1/5½	March	1/8	1/4	Taunton	1/9½	1/5
Bexhill-on-Sea	1/9½	1/5	Exmouth	1/9½	1/5	Margate	1/9	1/4½	Tenterden	1/9	1/4½
Bideford	1/9	1/4½	Fakenham	1/8	1/4	Market Harborough	1/10	1/5½	Thames Haven	1/11	1/6½
Biggleswade	1/9	1/4½	Falmouth	1/9½	1/5	Matlock	1/9½	1/5	Thetford	1/8½	1/4½
Billericay	1/8½	1/4½	Fareham	1/10	1/5½	Melton Constable	1/7½	1/3½	Thorpe Bay	1/10½	1/5½
Birchington	1/9	1/4½	Faversham	1/9	1/4½	Melton Mowbray	1/10	1/5½	Todmorden	1/11	1/6½
Birkenhead	‡§2/1	¶	Felixstowe	1/10	1/5½	Merthyr	1/11	1/6½	Tonbridge	1/9½	1/5
Birmingham	†1/11	1/6½	Filey	1/9½	1/5	Middlesbrough	1/11	1/6½	Torquay	1/10½	1/5½
Bishop Auckland	1/11	1/6½	Fleetwood	1/11	1/6½	Middleton	1/11	1/6½	Totnes	1/9	1/4½
Bishop's Stortford	1/10	1/5½	Flint	1/11	1/6½	Middlewich	1/10½	1/5½	Trowbridge	1/8	1/4
Blackburn	1/11	1/6½	Folkestone	1/9	1/4½	Milford Haven	1/9½	1/5	Truro	1/8½	1/4½
Blackpool	1/11	1/6½	Frinton-on-Sea	1/9	1/4½	Morecambe	1/11	1/6½	Tunbridge Wells	1/9½	1/5
Blyth	1/11	1/6½	Frome	1/8	1/4	Morley	1/11	1/6½	Uppingham	1/10½	1/5½
Bognor Regis	1/9	1/4½	Gainsborough	1/10	1/5½	Mundesley	1/8	1/4	Uttoxeter	1/10	1/5½
Bolton	1/11	1/6½	Gateshead	1/11	1/6½	Nantwich	1/10½	1/5½	Wakefield	1/11	1/6½
Bournemouth	1/10	1/5½	Gillingham (Kent)	1/10	1/5½	Nelson	1/11	1/6½	Walsall	1/11	1/6½
Bracknell	1/9	1/4½	Glossop	1/11	1/6½	Newark-on-Trent	1/10½	1/5½	Walsden	1/11	1/6½
Bradford	1/11	1/6½	Gloucester	1/10½	1/5½	Newbury	1/9	1/4½	Walton-on-Naze	1/9	1/4½
Bradford-on-Avon	1/8	1/4	Godalming	1/9	1/4½	Newcastle-on-Tyne	1/11	1/6½	Ware	1/10½	1/5½
Braintree	1/9	1/4½	Goole	1/11	1/6½	Newcastle-u.-Lyme	1/11	1/6½	Warminster	1/8	1/4
Brentwood	1/10½	1/5½	Gosport	1/10½	1/5½	New Forest	1/9	1/4½	Warrington	1/11	1/6½
Bridgwater	1/9½	1/5	Grantham	1/10	1/5½	Newmarket	1/9	1/4½	Warwick	1/11	1/6½
Bridlington	1/10½	1/5½	Gravesend	1/10½	1/5½	Newport, Mon.	1/11	1/6½	Wellington R.D.	1/10½	1/5½
Brighouse	1/11	1/6½	Great Yarmouth	1/9	1/4½	Newport Pagnell	1/9	1/4½	Welwyn	1/10	1/5½
Brighton	1/10	1/5½	Grimsby	1/11	1/6½	Northampton	1/11	1/6½	Welwyn Gar. City	1/11	1/6½
Bristol	1/11	1/6½	Guildford	1/9	1/4½	Norwich	1/11	1/6½	Wells (Norfolk)	1/7½	1/3½
Broadstairs	1/9	1/4½	Guilsborough	1/9½	1/5	Nottingham	1/11	1/6½	West Bromwich	1/11	1/6½
Bromsgrove	1/10½	1/5½	Halifax	1/11	1/6½	Nuneaton	1/11	1/6½	Westcliff-on-Sea	1/10½	1/5½
Buckley	1/11	1/6½	Hanley	1/11	1/6½	Oakham	1/9½	1/5	Weston-super-Mare	1/10	1/5½
Bungay	1/7	1/3½	Harpenden	1/10	1/5½	Oldham	1/11	1/6½	Weybridge	1/10	1/5½
Burnham-on-Crouch	1/7½	1/3½	Harrogate	1/11	1/6½	Ormskirk	1/11	1/6½	Weymouth	1/9	1/4½
Burnley	1/11	1/6½	Hartlepools	1/11	1/6½	Oxford	1/10½	1/5½	Whitby	1/10	1/5½
Burnham	1/11	1/6½	Harwich	1/9	1/4½	Oxted	1/9½	1/5	Whitstable	1/9	1/4½
Burton-on-Trent	1/11	1/6½	Haslemere	1/9	1/4½	Paignton	1/10½	1/5½	Widnes	1/11	1/6½
Bury	1/11	1/6½	Hastings	1/9	1/4½	Peterborough	1/10½	1/5½	Wigan	1/11	1/6½
Bury St. Edmunds	1/8½	1/4½	Hatfield	1/10½	1/5½	Plymouth	1/11	1/6½	Wigton	1/9½	1/5
Buxton	1/10½	1/5½	Haywards Heath	1/9	1/4½	Pontefract	1/11	1/6½	Willington	1/11	1/6½
Byfleet	1/9½	1/5	Hednesford	1/10½	1/5½	Pontypridd	1/11	1/6½	Wilmslow	1/11	1/6½
Cambridge	1/11	1/6½	Hemel Hempstead	1/10	1/5½	Port Talbot	1/11	1/6½	Winchester	1/9½	1/5
Canterbury	1/9	1/4½	Henley-on-Thames	1/9	1/4½	Portsmouth	1/10½	1/5½	Windermere	1/9½	1/5
Cardiff	1/11	1/6½	Hereford	1/9	1/4½	Preston	1/11	1/6½	Windsor	1/10	1/5½
Carlisle	1/11	1/6½	Herne Bay	1/9	1/4½	Pulborough	1/9	1/4½	Wisbech	1/8½	1/4½
Carnforth	1/11	1/6½	Hertford	1/10½	1/5½	Ramsgate	1/9	1/4½	Witham	1/9	1/4½
Castleford	1/11	1/6½	Heysham	1/11	1/6½	Reading	1/10½	1/5½	Woking	1/9½	1/5
Caterham	1/11	1/6½	Hitchin	1/10	1/5½	Redditch	1/10½	1/5½	Wokingham	1/9	1/4½
Chard	1/8	1/4	Hoddesdon	1/10½	1/5½	Redhill	1/9½	1/5	Wolverhampton	1/11	1/6½
Chatham	1/10	1/5½	Holt (Norfolk)	1/7½	1/3½	Ripon	1/9½	1/5	Woodbridge	1/8½	1/4½
Chelmsford	1/10½	1/5½	Horley	1/9	1/4½	Rochdale	1/11	1/6½	Worcester	1/10½	1/5½
Cheltenham	1/10	1/5½	Horsham	1/9	1/4½	Rochester	1/10	1/5½	Workington	1/9½	1/5
Chepstow	1/10½	1/5½	Horwich	1/11	1/6½	Rugby	1/11	1/6½	Worksop	1/10½	1/5½
Chertsey	1/10	1/5½	Huddersfield	1/11	1/6½	St. Albans	1/10½	1/5½	Worthing	1/9	1/4½
Chester	1/11	1/6½	Hull	1/11	1/6½	St. Helens	1/11	1/6½	Wrexham	1/10½	1/5½
Chesterfield	1/11	1/6½	Hunstanton	1/8	1/4	St. Neots	1/8½	1/4½	Wroxham	1/8½	1/4½
Chichester	1/9	1/4½	Huntingdon	1/8½	1/4½	Saffron Walden	1/8	1/4	Wycombe	1/10	1/5½
Chorley	1/11	1/6½	Ilfracombe	1/9	1/4½	Salisbury City	1/8½	1/4½	Wymondham	1/8	1/4
Cirencester	1/8½	1/4½	Ingatestone	1/9½	1/5	Salisbury Plain	1/10	1/5½	Yeovil	1/9½	1/5
Clacton	1/9	1/4½	Ipswich	1/10½	1/5½	Sawbridgeworth	1/9½	1/5	York	1/12	1/6½
Cleveleys	1/11	1/6½									

* Painters ½d. less than other Craftsmen. † Plus 2d. per working day. ‡ Plasterers 2/1½.

¶ Tradesman's Labourers, 1/7½. Navvies and General Labourers, 1/6½.

§ Joiners, Plumbers, Bricklayers, Tilers and Masons receive 2/- per week or 4d. per day Tool Money.

NOTE.—Carpenters and Joiners in all Towns and Districts (other than Birkenhead and Liverpool) receive 2d. per day Tool Allowance.

For Building Trade Wages in Scotland, see page 100.

PRICES CURRENT OF MATERIALS*

Note; Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry. The prices of soft woods are for cash on delivery. At present linseed oil and genuine spirits of turpentine can only be supplied in cans in small quantities.

BRICKS, &c.

	£ s. d
First Hard Stocks	4 13 0
Second Hard Stocks	4 6 0
Mild Stocks	3 13 0
Single Rough Stocks	3 7 0
Common Stocks	2 17 6

All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job. *In addition*, there will be the Levy under the Bricks (Charges) Order, 1942, of 3s. per 1,000.

	King's Cross Station per 1,000	To sites in W.C. District per 1,000
2½ in. Phorpres. A discount of 6d. 1,000 only monthly account.	s. d.	s. d.
Pressed	56 9	63 3
Keyed	58 9	65 3
Single Bullnose	76 9	83 3
Rustics	76 9	83 3
Whites	77 3	83 3

	£ s. d.
White Midhurst Best selected (delivered London site)	5 10 0
Best blue Pressed Staffs. (London Stns.)	11 12 0
Do. Bullnose (London Stns.)	12 2 0
Blue Wire Cuts (London Stns.)	10 9 6

Best Stourbridge Fire Brick (London Stns.) :—

£ s. d.		£ s. d.
2½ in. 10 0 0	3 in.	12 0 0

GLAZED BRICKS. (London Stns.)

Best White Ivory	D'ble Str'tch'rs	38 10 0
and Salt Glazed	D'ble Headers	35 10 0
Stretcher 30 0 0	One side&two ends	39 10 0
Headers 29 10 0	Two sides&one end	40 10 0
Quoins, Bullnose and 4½ in. Flats 36 10 0	Splays and Squints	38 0 0

Second Quality, £2 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours, Hard Glaze, £5 10s. extra over white.

ADD LEVY ON BRICKS, 3/- per 1,000 except Glazed Bricks.

PARTITION SLABS.

Delivered on site London Area.

"PHORPRES" HOLLOW PARTITION BLOCKS.

	s. d.		s. d.
2" per yd. sup.	2 8	3" per yd. sup.	3 6
2½ " "	2 11	4" " "	3 10

CLINKER CONCRETE.

2" per yd. sup.	1 11	3" per yd. sup.	2 6
2½ " "	2 3	4" " "	3 6

CRANHAM TERRA COTTA.

Size 12 x 9 x 2" per yd. super	2 8
Size 12 x 9 x 2½ " "	2 11
Size 12 x 9 x 3" "	3 6
Size 12 x 9 x 4" "	3 10

HEMPSTEAD—KEYED TWO SIDES.

12" x 9" x 2"	2 8	12" x 9" x 3"	3 6
12" x 9" x 2½"	2 11	12" x 9" x 4"	3 10

Per yard super d/d. Free on site, London.

Plus 2d. for smooth one side, and 4d. for smooth both sides.

STONE.

	s. d.
BATH STONE.—Delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	3 3½
BEER STONE—RANDOM BLOCK—	
Free on rail at Seaton Station per ft cube	2 3
Delivered free on rail Nine Elms, S.R. "	3 1½
Selected approximate size one way, 1d. per cubic ft. extra, selected approximately three sizes or for special work, 3d. per cubic ft. extra.	
PORTLAND STONE—	
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, S. Rly., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 7
Do. do. delivered on road waggons as above stations per ft. cub.	4 7
White basebed, 3d. per ft. cube extra.	
NOTE.—1d. per ft. cube extra for every ft. over 20 ft. *average* and ½d. beyond 30 ft.	
HOPTON-WOOD STONE—	s. d.
F.O.R. Quarries, Wirksworth, Derbyshire, Random blocks from 10 ft. and over P.ft.cb.	13 2
Sawn two sides	26 11
Sawn three or four sides	31 11
YORK STONE, BLUE—*Robin Hood Quality.*	
Delivered at any Goods Station, London.	
6 in. sawn two sides landings to sizes (under 30 ft. super) ? per ft. super	5 6
6 in. rubbed two sides, ditto "	6 3
3 in. sawn two sides slabs (random sizes) "	2 7
2 in. to 2½ in. sawn one side slabs (random sizes) (paving) "	1 8½
1¼ in. to 2 in. ditto "	1 4½
HARD YORK—	
Delivered at any Goods Station, London.	
Scrappled random blocks per ft. cube	6 10
6 in. sawn two sides landings to sizes (under 40 ft. super) per ft.super	5 7½
6 in. rubbed two sides, ditto "	6 9
4 in. sawn two sides slabs (random sizes) "	3 5
3 in. ditto ditto "	2 8
2 in. self-faced random flags per yd. super	8 9

CAST STONE.

Delivered in London area in full van loads, per ft. cube: Plain, 7s. 6d. Moulded, 8s. 6d. Small section cills and copings, 11s.

SAND.

Thames Ballast	10s. 0d. per yd.	delivered 2 miles radius Paddington.
Pit Ballast	9s. 6d. " "	
Pit Sand	12s. 0d. " "	
Washed Sand	13s. 0d. " "	
¼ in. Shingle	10s. 6d. " "	
¼ in. Broken Brick	16s. 0d. " "	
Pan Breeze	10s. 0d. " "	

CEMENT.

Best British Portland Cement. Standard Specification, delivered London area.

	£ s. d.
6 ton loads and upwards site per ton	2 11 0
1 ton to 6 tons site	2 14 0
Alongside Vauxhall in 80 ton lots	2 8 6
"Ferrocrete" Rapid Hardening Cement—	
6 ton loads and upwards site	2 17 0
1 ton to 6 tons site	3 0 0
Alongside Vauxhall in 80 ton lots	2 14 6
"Aquacrete" Water Repellent, "Blue Circle" cement, 30s. per ton on ordinary "Blue Circle" prices.	
"Colorcrete" Nos. 1 and 2. Coloured rapid Hardening Portland Cement in 6 ton lots	4 11 0
"Colorcrete" not rapid hardening, according to colour, from £7 to £15 10s. per ton.	
"Snowcrete" White Portland Cement (in free paper bags)	10 5 0
"417" Cement (Ultra Rapid Hardening) Delivered Site London Area in 6 tons lots and upwards	3 11 0
Plus packages at current prices.	
Super Cement (Waterproof), bags extra	4 1 0

NOTE.—Jute sacks charged at 35s. 6d. nett per ton (20 sacks) for quantities of or exceeding one ton. Less than one ton 1s. 9½d. nett each. Credit 1s. 6d. nett each when returned in good condition within two weeks.

	£ s. d.		£ s. d.
Romance ment	8 10 0	Keene's Cement, White	7 0 0
Parian Cement	7 0 0	" Pink	6 10 0

Cementone Colours for cement according to tints per cwt. from £3 5s. 0d.

SLATES.

First quality slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.

	£ s. d.		£ s. d.
24 by 12	45 5 0	18 by 10	24 0 0
22 by 12	37 17 6	18 by 9	22 12 6
22 by 11	34 2 6	16 by 10	21 10 0
20 by 12	33 0 0	16 by 8	16 12 6
20 by 10	30 5 0		

PLASTER.

	£ s. d.		£ s. d.
Coarse, Pink	4 2 6	Sirapite, Coarse	4 8 6
" White	4 10 0	" Finish	4 14 6
Pioneer	4 0 6		

Above prices for 4-ton loads and over London Area.

Best Ground Blue		Grey Stone Lime	3 1 0
Lias Lime	3 7 6	Chalk Lime	3 1 0
Granite Chippings	1 15 0	Hair per cwt.	3 15 0

NOTE.—Sacks are charged 1s. 9d. each, and credited 1s. 6d. if returned in good condition within three months, carriage paid.

Stourbridge Fireclay in paper bags, £2 12s. 6d. in 6-ton lots at railway depot.

TILES.

Delivered at London rate stations in full truck loads of not less than 6 tons. Per 1,000 f.o.s. London.

	£ s. d.
Best machine-made tiles from Brossley or Staffordshire district	£5 13 0
Ditto hand-made ditto	6 18 6
Ornamental ditto	7 8 0
Hip and valley tiles (per dozen) Hand-made	0 14 0
Hip and valley tiles (per dozen) Machine-made	0 13 6

HARD WOOD.

1 INCH AND UP THICK.

Average price for prime quality.	s. d.		Foot cube. £ s. d.
Dry English Wainscot Billets	16 0	to 0	18 0
Dry Slavonian Billet Wainscot	17 0	to 1	0 0
Dry Cuba Mahogany logs	21 0	to 1	4 0
Square-edged Honduras Mahogany		0	16 6
Log Cut Honduras Mahogany		0	17 6
American Figured Oak		0	13 0
American Plain Oak		0	12 6
Jap. Figured Oak		0	13 0
Jap. Plain Oak		0	12 6
Teak		0	15 0
American Whitewood		0	12 6
African Whitewood		0	8 0
African Mahogany		0	11 0
Australian Walnut		0	19 0
Australian Silky Oak		0	12 6

Best Scotch glue per cwt.	5 0 0
Liquid glue per gallon	1 2 0

SOFT WOOD.

	MERCHANTABLE BRITISH COLUMBIAN Minimum. £ s. d.	PINE Maximum. £ s. d.
Scantlings in imported sizes, 2 in. by 3 in. to 4 in. by 11 in.	43 10 0	53 0 0

PLANED BOARDS.

PRIME CLEAR BRITISH COLUMBIAN PINE.

	Per standard. £ s. d.
1 in. by 11 in. } 1 in. by 9 in. }	67 10 0

	Per square. s. d.
1 in. plain edge flooring	53 0
1¼ in. ditto	66 6
1 in. tongued and grooved	53 0
1¼ in. ditto	66 6

MATCHING.

	Per square. s. d.
¾ in.	37 6
⅞ in.	42 0
1 in.	55 0

PLUMBERS' BRASS WORK.

Delivered in London.

M.O.H.

S.D. BIBCOCKS CRUTCH HEAD, FOR IRON

½ in.	¾ in.
33/-	46/6 per doz.

TOILET BIB COCKS FOR IRON.

½ in.	¾ in.
42/-	60/- per doz

S.D. STOP COCKS FOR IRON.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
33/-	48/-	86/-	209/-	281/-	456/- per doz.

S.D.S. COCKS WITH TWO UNIONS FOR LEAD

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
45/-	77/6	123/-	240/-	372/-	624/- per doz.

DOUBLE NUT BOILER SCREWS.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
5/6	6/8	11/-	24/-	36/-	56/- per doz.

HEAVY CROYDON BALL VALVES.

½ in.	¾ in.	1 in.	1¼ in.	1½ in.
60/-	96/-	120/-	215/-	296/- per doz.

CAPS AND SCREWS.

1½ in.	1¾ in.	2 in.	3 in.	3½ in.	4 in
11/9.	14/3	21/6	37/9	54/-	59/6 per doz.

BRASS SLEEVES.

1¼ in.	2 in.	3 in.	3½ in.	4 in.
10/9	13/6	25/-	37/-	46/- per doz.

LEAD TRAPS WITH BRASS CLEANING SCREWS.

	1½×6 lbs.	1½×6 lbs.	2×7 lbs.	3×7 lbs.
Lead P.	26/-	34/-	55/-	92/- per doz.
Lead S.	34/-	41/-	67/	115/- per doz.

SOLDER.—Plumbers', 1/5. Tinmen's, 1/9. Blow pipe. 2/- per lb.

* The information given on this page has been specially compiled for THE BUILDER, and is copyright. The aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information. Prices are subject to 2½ per cent. cash discount.

PRICES CURRENT OF MATERIALS—(contd.)

METALS.

JOISTS, GIRDERS, &c., to LONDON STATION PER TON—

	£	s.	d.
R.S. Joists, cut and fitted	£23	10	0
Plain Compound Girders	26	0	0
Stanchions	28	10	0
In Roof Work	33	10	0

NOTE.—These prices are for standard pieces and not special pieces of an awkward nature.

MILD STEEL ROUNDS.—To London Stations, per ton.

Diameter.	£	s.	d.	Diameter.	£	s.	d.
¼ in.	23	0	0	⅜ in. to ½ in.	21	10	0
⅛ in.	22	0	0	⅝ in. to 2½ in.	21	0	0

WROUGHT TUBES AND FITTINGS.

Deliveries from works.

Deliveries from London stock further 2½ % gross.

	Tubes. ⅛"/6"	Tubulars. ⅛"/6"	10/17 and 19/24	Flanges. ⅛"/2"	⅛"/6"
	½	¼	½	¼	¼
Light weight	51½	—	47½	51	57½
Heavy weight	44	44	39½	41	49½
Galv.lightweight	40½	—	38½	39½	48½
Galv.heavyweight	31	31	31	29½	41

Tubes and tubulars sizes ⅛"/⅛" inclusive, charged extra of 5% less gross.

Fittings. Figs. 25/34 5% less gross discount.

Terms.—Nett cash end of month following date of invoice. Carriage paid on lots of £10 nett value and over.

C.I. HALF-ROUND GUTTERS—London Prices ex Works. per yd. in 6 ft. lengths.

	Gutters.	Nozzles.	Stop ends.
3 in.	1/5½	1/2½	4½d.
3½ in.	1/7	1/4	4½d.
4 in.	1/7	1/6	6½d.
4½ in.	1/8½	1/8½	7½d.
5 in.	2/0½	2/0	9d.

O.G. GUTTERS.

3 in.	1/10½	1/7½	5d.
3½ in.	2/1½	1/7½	6½d.
4 in.	2/1½	1/8½	7½d.
4½ in.	2/2½	1/11½	8½d.
5 in.	2/8½	2/3	10½d.

RAIN WATER PIPES.

Per yd. in 6 fts.	Pipe	Bends. Stock angles.	Branches.
2 in.	2/2½	1/5½	2/2
2½ in.	2/3½	1/8½	2/7½
3 in.	2/8½	2/1½	3/2
3½ in.	3/2½	2/6½	3/7½
4 in.	3/8½	3/0½	4/5

NETT PRICES.

Tonnage allowance—4-ton lots, 5 per cent. 2-ton lots, 2½ per cent.

L.C.C. COATED SOIL PIPES—London Prices, ex Stock.

Per yd. in 6 fts.	Pipe.	Bends.	Branches.
2 in.	3/9½	2/7½	3/2
2½ in.	4/5	2/10½	3/11½
3 in.	4/9	3/2	4/8½
3½ in.	4/10½	3/11½	5/5½
4 in.	5/3½	4/5-	6/3½

L.C.C. COATED DRAIN PIPE.

cwt. qr. lbs. in 9 fts.	per yard.	Bends.	Branches.
3 in. 0 3 14	5/10	6/11	11/-
4 in. 1 1 20	7/11	7/11	13/10
5 in. 1 2 22	10/1	14/2	21/5
6 in. 2 0 6	12/3	16/4	28/4

Gaskin, 75/- per cwt.

	Per ton basis in London. £	s.	d.
IRON.—Staffordshire Crown, Merchant quality	18	7	6
IRON.—Staffordshire Marked Bars	19	7	6
Mild Steel Bars	19	15	0
Mild Steel Hoops	21	10	0

Ex Merchant's Stock, per ton (two-ton lots).

	£	s.	d.
Soft Steel Sheets, C.R. and C.A.—			
20 gauge	24	17	6
24 gauge	25	2	6
26 gauge	25	17	6
Galvanised Corrugated Sheets, 6 ft. to 9 ft.			
20 gauge	27	0	0
24 gauge	27	10	0
26 gauge	28	15	0
Galvanised Flat Sheets, C.R. and C.A.—			
20 gauge	28	10	0
24 gauge	29	0	0
26 gauge	30	5	0

	Per ton. £	s.	d.
Cut Nails, 3 in. and up	28	10	0

ALL NETT.

METAL WINDOWS.—Standard sizes, suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 2s. 4d. to 2s. 7d. per foot super.

PAINTS, &c.

	£	s.	d.
Raw Linseed Oil (5 galls.) .. per gallon	0	5	9
Boiled Linseed Oil (5 galls.) .. "	0	6	0
Genuine Ground English White Lead, per cwt.	3	11	3
Genuine White Lead Paint, 14 lb. tins free, per cwt.	4	15	6
Genuine Red Lead, "	2	18	0
Linseed Oil Putty (Kegs extra) .... "	1	3	3
Size, XD quality .... ffkn.	0	4	9

Turpentine substitute can be obtained and prices vary according to quality from 3/8 gallon upwards.

	£	s.	d.
SNOWCEM CEMENT PAINT ..... per cwt.	2	16	0
C.M.C. CAMOUFLAGE PAINT ..... "	2	16	0

BUILDING TRADE WAGES IN SCOTLAND

Following are grade rates authorised by the Scottish N.J.C. from October 1. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur.

Grade Classification	A	A1	A2	A3	B	B1
Craftsmen	1/11½	1/11	1/10½	1/10	1/9½	1/9
Labourers	1/6	1/5½	1/5½	1/5	1/4½	1/4½

Aberdeen	A	Dumfriesshire	A2	Inverness	*	Perthshire	A2
Ayrshire	A	Dundee	A	Inverurie	A1	Peterhead	A1
Banff	B	Dunoon	A	Kincardineshire	A2	Renfrewshire	A
Berwickshire	A2	East Fife	A	Kinross-shire	A	Rothesay	A
Bridge of Allan	A	East Lothian	A	Lanarkshire	A	Roxburghshire	A2
Broughty Ferry	A	Edinburgh	A	Midlothian	A	St. Andrews	A
Clackmannanshire	A	Fifeshire	A	Monifieth	A	Selkirkshire	A2
Doune	A	Forfarshire	A2	Moray and Nairn	B	Stewartry	A2
Dunblane	A	Glasgow	A	Newport	A	Stirlingshire	A
Dumbartonshire	A	Greenock	A	Peeblesshire	A2	Stornoway	A2
Dumfries	A1	Hamilton	A	Perth	A	Tayport	A
						West Lothian	A

*This town has its own rates: Masons, 1/8½; Carpenters, 1/8½; Slaters, 1/8½; Plumbers, 1/9; Plasterers, 1/9½, but 1/10 is paid owing to the scarcity at present; Painters, 1/8½ and Labourers, 1/4

The information given in this table is copyright. Rates of wages in England and Wales are given on page 98.

VARNISHES, &c.

		Per gallon. £	s.	d.
Oak Varnish	Outside	0	16	0
Fine do.	"	0	18	0
Fine Copal	"	1	0	0
Pale Copal	"	1	2	0
Pale Opal Carriage	"	1	6	0
Best do. do.	"	1	14	0
Floor Varnish	Inside	1	0	0
Fine Pale Paper	"	1	0	0
Fine Copal Cabinet	"	1	4	0
Fine Copal Flatting	"	1	2	0
Hard Drying Oak	"	1	0	0
Fine Hard Drying Oak	"	1	1	6
Fine Copal Varnish	"	1	2	6
Pale do.	"	1	14	0
Best do.	"	1	4	6
Best Japan Gold Size	"	1	14	6
Best Black Japan	"	0	12	0
Oak and Mahogany Stain (water)	"	0	14	0
Brunswick Black	"	0	9	6
Berlin Black	"	0	16	0
Knotting (patent)	"	0	17	0
French and Brush Polish	"	0	14	0
Liquid Dryers in Terebene	"	0	11	0
Cuirass Black Enamel	"	0	9	0

LEAD, &c.

(Delivered in London.)	Per ton. £	s.	d.
LEAD.—Sheet, English, 4 lb. and up	38	0	0
Pipe in coils	38	10	0
Soil pipe	42	10	0
Compo pipe	47	10	0

NOTE.—Country delivery, 20/- per ton extra, lots under 3 cwt. 4/- per cwt. extra and over 3 cwt. and under 5 cwt., 2/6 per cwt. extra. Cut to sizes, 4/- per cwt. extra.

Old lead, ex London area, at Mills ..... per ton £18 0 0.

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NEW BUILDINGS

GLASGOW.—Plans prepared for alterations and additions, the architects being Thomson, Sandilands & McLeod, 248, West George-st., Glasgow.

GLASGOW. — Plans prepared by William MacNab, architect, Housing Director, for alterations and additions, at Atherhill-st. and Bouverie-st.

L.M.B.A. North-Western Branch.

The first annual general meeting of the North-Western Area of the London Master Builders' Association was held at the Rest Hotel, Kenton, when the chairman, Mr. D. F. Cox, of Haymills (Contractors), Ltd., Ealing, reviewed the work of the Area over the past year. Mr. W. S. Try, of Messrs. W. S. Try, Ltd., Uxbridge, was elected chairman of the Area for 1943.

GLASS.

SHEET GLASS, ORDINARY GLAZING QUALITY CUT SIZES.

	Per ft. super. d.
18 oz.	3½
24 oz. Clear or "R" quality	4½
26 oz.	5½
32 oz.	7½

ENGLISH ROLLED PLATE AND FIGURED CATHEDRAL, ETC., IN CUT SIZES.

Over 500 ft. super of all kinds.	Per ft.
Rolled plate, ¼ in.	5½d
Rough cast double rolled, ⅛ in.	6½d.
Rough cast double rolled, ¼ in.	6½d.
Figured rolled, and Cathedral, white	6½d.
Figured rolled and Cathedral, tinted	9½d.
Rolled Sheet	6d.
Reeded, Broad Reeded, Cross Reeded and Chevron Reeded, ¼ in. thick	10½d.

Rolled plate is the same price as rough cast double rolled.

	Per ft. s.	d.
Wire Rolled, ¼ in. thick	0	9½
Wire Cast, ¼ in. thick	0	9½
Georgian Wired Cast	0	10
"Calorex" Sheet, 21 oz.	2	6
" " 32 oz.	4	0
" Cast, ⅛ in. thick	0	10
" " ¼ in. thick	1	0
" " ½ in. thick	1	2
Non Actinic Glass, ⅛ in. thick	0	9½
" " " ¼ in. thick	1	0
" " " ½ in. thick	1	2

"VITA" GLASS.

	Per ft. s.	d.
"Vita" Plate Glass, about ⅛ in. thick— To 7 ft. super.	5	0
Over 7 ft. super	7	6
"Vita" Sheet Glass, about 18/20 oz.	2	0
Cathedral "Vita" Glass:		
⅛ in. thickness	2	0
¼ in. "	3	0
⅛ in. Georgian Wired "Vita" Glass	3	6

GLASS BRICKS.

	s.	d.	
P.B. 1—8 in. × 4½ in. × 3½ in. ..	2	9	each nett
P.B. 2—5½ in. × 5½ in. × 3½ in. ..	2	6	"
P.B. 3—7½ in. × 7½ in. × 3½ in. ..	3	6	"
P.B. 32—7½ in. × 7½ in. × 3½ in. ..	3	6	"

Radiused Corner Bricks to match up with—

P.B. 2	4	6	each nett
P.B. 3	6	0	"
P.B. 32	6	0	"

CURRENT AND PROPOSED NEW BUILDINGS

Altrincham.—T.C. received approval for repairs to houses, at £370.

Batley.—T.C. propose extensions to maternity hospital.

Chapel-en-le-Frith.—Plans approved for structural alterations to "Squirrel Inn," Newtown, for Walker & Homfray, Ltd., Woodside Brewery, Eccles New-rd., Salford.

Chesterfield.—T.C. propose youth centre at Markham-rd., for Council of Youth.

Chesterfield.—R.D.C. propose reinstatement of condemned houses at Stonebroom.

Consett.—Plans approved for bakery and flour store, for Mr. A. R. Hanson.

Coventry.—T.C. propose: Adaptation of premises at Stretton-on-Dunsmore for residential nursery; conversion of buildings into houses for aged persons.

Darlington.—T.C. to consider suggestion for public conveniences on various sites. Plans by E. Minors, B.E.

Grantham. — Board of Management of Grantham hospital propose extensions to maternity ward, at £1,000.

Manchester.—T.C. approved: Dormitory, garage and extensions. H. S. Fairhurst & Son (FF.), architects, Chancery-chbrs., 55, Brown-st. — Manchester Brewery Co., Ltd., Woodside Brewery Co., Ltd., Woodside Brewery, Eccles New-rd., Salford, propose hotel at Cheetham.

Morecambe and Heysham. — T.C. approved additions to Alexandra-rd. bakery.

Newcastle-on-Tyne. — Extensions and alterations to be made to Princess Mary maternity home. Plans by W. Stockdale, 81, Howard-st., North Shields.

Oldham.—T.C. propose adaptation of Werneth Hall for midwives home, at £400.

Penketh.—Building Committee of Penketh and Great Sankey British Legion Club propose new club premises.

Salford.—T.C. approved conversion of Crescent House, Cheltenham-cres., Broughton, into synagogue, for Building Committee.

Shropshire.—C.C. propose two additional prefabricated buildings for youth centres, at £2,500.

Sunderland.—G. T. Brown & Son, Fawcett-st., Sunderland, prepared plans for additional stores.—E.C. to proceed with £4,887 plan for workshop at Technical College. Architects are J. Potts & Son, John-st., Sunderland.

Swinton and Pendlebury.—T.C. received sanction to proceed with repairs to houses, at £561.

Urmston.—T.C. approved plans for sub-station.

Wallsend.—T.C. is to erect nursery at Howdon. Plans by J. A. Blench, B.E.

Workington.—T.C. propose sanitary conveniences, at £240.

A.R.P. SCHEMES

Bangor (N. Wales).—T.C. propose rest centres.

Bridgnorth.—N.F.S. propose erection of fire station.

Halesowen.—T.C. propose fire station. Plans by G. Spurr, B.S.

Kirkham.—Lancashire C.C. propose additional structural protection at Fylde Institution, at £210.

Market Drayton.—U.D.C. to invite tenders for erection of fire station. Plans by J. G. Bailey, S.

New Mills (Derbyshire).—U.D.C. propose static water tank.

Newcastle-on-Tyne. — Contract for shelter at County Hall placed with Elliott Bros., Otterburn-terr., Jesmond, Newcastle-on-Tyne.

Pwllheli.—T.C. propose conversion of premises into public mortuary.

Salford.—T.C. approved shelter and bricking up windows to children's ward at Old People's Homes, Pendleton.

Stockport.—N.F.S. propose three static water tanks on selected points.

Stretford.—T.C. propose erection of shelter and blacking-out at Cornbrook B.R.

Sunderland. — Health Committee to erect shelter at Chester Moor nursery, at £280. Plans by J. E. Lewis, B.E.

Urmston.—U.D.C. approved construction of concrete bases for 10 static water tanks on selected sites, for N.F.S.

Wilton.—B.C. placed contract with Haynes & Son, Ivy-st., Salisbury, at £94, for erection of static water tank.

Workington.—T.C. to consider provision of additional public shelters and emergency lighting for B.R.

BRITISH RESTAURANTS AND CANTEENS

Bangor (North Wales).—T.C. propose feeding centres at Upper Bangor; Princes-rd. Chapel; Glanrafon Hill; Penlon C.E., Chapel; Pendref Wesleyan Chapel; Church House, Waterloo-st.; Church House, Glynne-rd.; Seion Chapel, Club-st.; and Railway Institute, Euston-rd.

Bromsgrove.—Worcestershire E.C. propose school canteen at Rashwood school.

Bury.—E.C. propose nine additional school feeding centres.

Coventry. — T.C. submitted revised scheme for B.R. at Market Hall, at £2,950 to M.F.—T.C. propose adaptation of premises for "cash-and-carry" communal feeding centres.

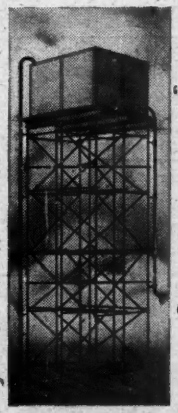
Gateshead.—Workshop and canteen to be built at North Eastern Trading Estate. Plans by J. H. Napper, 27, Eastwood-gdns., Gosforth, Newcastle-on-Tyne.

Glasgow.—Plans prepared for additions to the Dovehill cooking depot, Bell-st., the architect being John McNab, 129, Bath-st., Glasgow.

New Mills (Derbyshire).—U.D.C. propose B.R. Plans by W. C. Sheard, S.

Prudhoe-on-Tyne.—U.D.C. to set up communal feeding centre at Mickley. Plans by S.

Swinton and Pendlebury.—E.C. propose alterations to Cromwell-rd. schools for provision of kitchen. Plans by A. Cordwell, B.S.



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TENDERS

The Editor welcomes authentic information for this feature from architects, surveyors or contractors. Items should reach 4, Catherine-street, Aldwych, W.C.2, not later than Tuesday morning.

Tenders for A.R.P. work will be found under "A.R.P. Schemes."

* *Denotes accepted.*
† *Denotes provisionally accepted.*
‡ *Denotes recommended for acceptance.*
§ *Denotes accepted subject to modification.*
¶ *Denotes accepted by H.M. Government departments.*

Barrow-in-Furness. — Buildings for Barrow Steam Laundry, Ltd., Abbey-rd. Drury & Gomersall, architects, 17, Imperial-bldgs., Oxford-rd., Chorlton-on-Medlock: *Rainey Bros., Ltd., Ironworks-rd., Barrow-in-Furness.

Birkenhead.—Adaptation of premises (including painting and decorating) at Hollybank-rd., for nursery, for T.C.: *E. & C. Atkinson, Birkenhead, £407.

Bromsgrove. — Erection of central kitchen at Stourbridge-rd., for Worcestershire E.C. Henry Rowe & Son, County Architects, 38, Foregate-st., Worcester: *J. & A. Brazier, Ltd., Worcester-rd., Bromsgrove, £1,340.

Camberwell.—Works, for B.C.: Erection of prefabricated hut for nursery at Dog Kennel Hill: *W. J. Mitchell & Son, £2,503 (subject to M.H. approval); erection of prefabricated hut at Peckham Park-rd.: *John Harrison (London), Ltd., £2,338 (subject to M.H. approval).

Glasgow. — For alterations and extensions, for the British Sailors' Society. James Marshall, architect, 3, Charles-st., Springburn-rd., Glasgow: *Cowiesons, Ltd., Glasgow.

Lancashire.—Works, for C.C. L. Evans, County Architect, County-bldgs., Preston. Structural alterations to schools for feeding centres:—

Earnshaw Bridge, Leyland St. James', Leyland Senior and Junior schools: *A. & H. Bennett, 19, School-la., Leyland, nr. Preston; Leyland C.E. and St. Mary's R.C. schools: *Cocker Bros., 114, Towngate, Leyland, nr. Preston; Euxton C.E. and St. Mary's R.C. schools: *F. M. Brindle, 80, Bolton-rd., Chorley; Kearsley Moor C.E. and Mount Methodist schools: *T. Entwistle, Albert-rd., Farnworth, nr. Bolton; Little Lever Senior schools: *B. C. Waters, 79, High-st., Little Lever, Bolton; Prestolee school: *F. Holdsworth, 6, High Stile-st., Farnworth, nr. Bolton; Ramsbottom Hazelhurst and Turn schools: *T. & J. Foster, Peel Bridge, Ramsbottom, nr. Bury; Litherland English Martyrs R.C., Netherton R.C., Sefton and Litherland Central schools: *J. B. Glover, 4, Oxford-av., Litherland; Litherland St. Philip's C.E., St. Elizabeth's R.C. schools: *Stuart & Musker, 29, Bridge-st., Litherland; Litherland Beach-rd. school: *Parker Bros. (Waterloo), Ltd., 115, Oxford-rd., Waterloo; Formby R.C. Boys' and Infants' schools: *Dean Bros., Gores-la., Freshfield; Formby St. Peter's C.E. Boys', Girls' and Infants' schools; *Meadow Bros., Old Mill-la., Formby; Worsley Hulton Peel St. Paul's C.E. schools: *G. & J. Seddon, Ltd., 5, Manchester-rd. West, Little Hulton, nr. Bolton (rest of Liverpool).

Leyland.—Extensions to Senior school, for Lancashire E.C. L. Evans, County Architect, County-bldgs., Preston: *H. H. Topping & Son, Ltd., Lytham-rd., Fulwood, Preston, £472.

¶London (Air Ministry).—New works contracts for week ended January 16. Value £500 and over for Works Services.

General maintenance work: Hadsphaltic Construction Co., Ltd., Wellington, Salop; C. E. Mills, Hereford; Dolton Bros., Ltd., Worcester; Brown & Sons, Ltd., Stranraer; D. & J. Milligan, Ayr; Woods Contractors (London), Ltd., London, W.C.2; G. E. Wallis & Sons, Ltd., Truro; J. G. Green & Sons, Ltd., Morpeth.

Civil engineering work: George Wimpey & Co., Ltd., Denham, Uxbridge, Middx.; A. Monk & Co., Ltd., Warrington, Lancs.

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¶**London (Ministry of Works).**—Contracts placed by M.O.W.P. during week ending January 14:—

Bucks: Htg. & H.W. services, F. Church, Canterbury Works, Glanville-rd., Oxford.

Ches: Building work, Bethell & Sons, Ltd., Dane-rd., Sale, Ches.

Devonshire: Building work, Stephens & Son (1941), Ltd., Flowerpot, Okehampton-st., Exeter.

Glos: Electrical work, Tyler & Freeman, 40, Chancery-la., London, W.C.2.

Lincs: Civil engineering, Wests Piling & Construction Co., Ltd., Bath-rd., Harmondsworth, Middx.; building work, E. E. Jeavons & Co., Ltd., Tipton, Staffs.

Northamptonshire: Building work, Kier & Co., Ltd., 9, Leopold-rd., S.W.19.

Staffs: Electrical work, Electra (Birmingham), Ltd., 12, Barwick-st., Birmingham 3.

Surrey: Painting work, R. L. Lacey, Kingslea, Leatherhead.

Wilts: Building work, Kent & Sussex Contractors, Ltd., Carlton-rd., Erith, Kent.

Worcs: Civil engineering, E. E. Jeavons & Co., Ltd., Tipton, Staffs; Htg. & H.W.S., C. B. Jackson & Co., Ltd., 54, Victoria-st., London, S.W.1.

¶**London (War Dept.).**—Works contracts placed by War Dept. for week ended January 9:—

Perthshire: Miscellaneous work, J. B. Stewart & Sons, Coupar, Angus.

Clackmannanshire: Miscellaneous work, Jas. McIntosh, Jnr., Alva, Clackmannan.

Stirlingshire: Miscellaneous work, Robt. Beatson & Son, Stirling.

Midlothian: Hutting (erection), John Crow & Sons, Edinburgh.

Co. Durham: Miscellaneous work, J. Burnett & Son, Birtley, Co. Durham.

Yorks: Miscellaneous work, W. Horner & Son, Ltd., Pontefract; F. P. Leach & Son, Bradford.

Lincs: Hutting (erection), Wilkinson & Houghton, Cleethorpes.

Derbyshire: Building work: Edward-Thompson, Ltd., Derby.

Shropshire: Miscellaneous work, P. Bailey & Co., Ltd., Stoke-on-Trent.

Cambs: Miscellaneous work, J. H. Cross, Littleport, Cambs.

Pembrokeshire: Hutting (erection) and miscellaneous work, Hussey, Egan & Pickmere, Ltd., Pembroke.

Essex: Hutting (erection), E. A. Coryn & Son, Hornchurch, Essex.

Berks: Hutting (erection), W. A. James & Son, Maidenhead, Berks.

Brecknockshire: Hutting (erection), T. F. Howells, Ltd., Caerphilly, Glamorgan.

Wilts: Miscellaneous work, W. Bell & Son (Andover), Ltd., Andover, Hants.

London, S.E.: Hutting (erection), Limpus & Son, Ltd., Kingston-on-Thames.

Hampshire: Roadwork, W. F. Rees, Ltd., London, S.W.

Newcastle-on-Tyne. — Provision of scullieries and w.c.s at two cottages at Balliol College Farm, Longbenton, for City Council: *Elliott Bros., Otterburn-ter., Newcastle-on-Tyne, £250.

Northumberland.—Work in connection with school meals, for E.C. W. W. Tasker, County Architect, County Hall, Newcastle-on-Tyne. Erection of "Nash-crete" building as cooking depot at Pegswood: *R. C. Williamson, Rowlands Gill, Co. Durham, £880; extension of canteen at Ashington Hirst Park Senior school: *J. T. Fletcher, Ashington, £1,049; conversion of workshop into canteen at Bedlington Cambois school: *J. W. Urpeth, Bedlington, £400.

Rochester.—Construction of B.R. at East-row, for T.C.: *Shave Bros., Chatham, £2,772.

Sedgley.—Hostel, Upper Gornall, for U.D.C. A. E. Dicks, S.: *E. Fletcher, Enville-rd., Wall Heath, nr. Dudley, £3,749.

Stockport.—Erection of boiler-house at Reddish Public Baths, for T.C. W. F. Gardner, B.E.: *J. Foulkes & Son, Whicken-st., Offerton-la., Stockport, £306.

Sunderland.—Provision and erection of water softening plant at electricity works, for T.C.: *Paterson Engineering Co., Ltd., £4,442.

Sunderland.—Provision of canteen at St. Anthony's R.C. Secondary school, for E.C.: *Direct labour by Education Works Dept.

Wandsworth.—Adaptation of premises at Larkhall-rise for day nursery, for B.C.: *Whyatt & Smith, Balham, £2,495.

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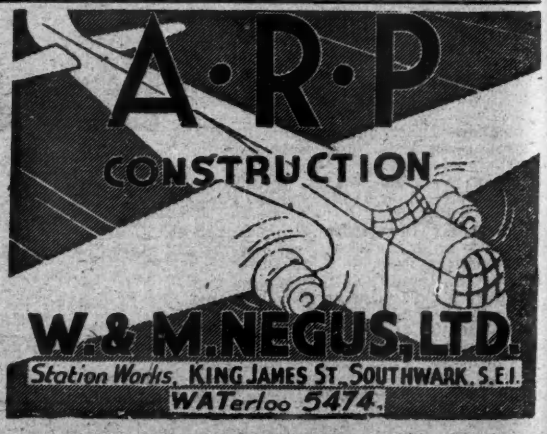
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